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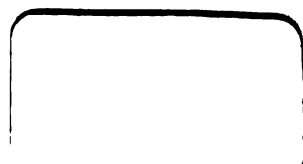
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THE  
AMERICAN EPHEMERIS

AND  
NAUTICAL ALMANAC

FOR THE YEAR

1910

*FIRST EDITION*

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*PUBLISHED BY AUTHORITY OF CONGRESS*

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WASHINGTON  
BUREAU OF EQUIPMENT  
1906

~~See 820.5~~

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From the  
U. S. Government.

## P R E F A C E.

The general arrangement of the *American Ephemeris and Nautical Almanac*, with few slight changes, remains the same with the volume for the year 1900.

The Ephemeris is divided into four parts, as follows:

Part I, *Ephemeris for the Meridian of Greenwich*, which gives the ephemerides of the Sun and Moon, the geocentric and heliocentric positions of the major planets, the Sun's co-ordinates, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, which gives the ephemerides for the fixed stars, Sun, Moon, and major planets for transit over the meridian of the new Naval Observatory, Washington. The mean places of the fixed stars and the data for their reduction are also included in this part.

Part III, *Phenomena*, which contains predictions of phenomena to be observed, with data for their computation. Washington mean time for the meridian of the new Naval Observatory is used throughout this part except in a few cases, notably those of eclipses, where Greenwich mean time seems more convenient.

Part IV, *Star numbers, apparent places of stars, and other data based on the Constants of the Paris Conference of 1896*, which gives precession, obliquity, etc., Besselian star-numbers, independent star-numbers, ephemerides of five northern circumpolar stars, and ephemerides of twenty-five other stars whose apparent places differ from those given in Part II.

WALTER S. HARSHMAN,

*Professor of Mathematics, U. S. Navy,*

*Director Nautical Almanac.*

WASHINGTON, *November, 1906.*



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# CORRECTIONS.

## *Ephemeris, 1908, first edition only.*

Page.		<sup>s</sup>	<sup>s</sup>
110,	R. A. July 9	for 1.72	read 1.82
248,	Dec. 34, Var. R. A.	for 15.336	read 15.342
308,	d Bootis	<sup>s</sup> for 12.328	<sup>s</sup> read 12.230
		<sup>s</sup> for 2.7401	<sup>s</sup> read 2.7372
367,	d Bootis R. A. decrease the column of seconds by .10	<sup>s</sup>	<sup>s</sup>
527,	at foot of the page	for 1.70120	read 1.70121
		0.1377	0.1376
		0.1373	0.1372
		9.13893	9.13863
		9.13773	9.13744

## *Ephemeris, 1909, first edition only.*

223,	Dec. 32 Var. of Decl.	for "	read "
		for 54.17	read 54.19
248,	Apr. 17 Meridian Passage	<sup>h</sup> <sup>m</sup> for 17 58.5	<sup>h</sup> <sup>m</sup> read 17 48.5
261,	Dec. 33 Longitude	for 52.0	read 52.4
	Latitude	for 6.2	read 6.5
	Log Dist.	for 179	read 198
423,	Dec. 31 R. A.	<sup>s</sup> for 24.29	<sup>s</sup> read 24.28
	Dec. 32 R. A.	<sup>s</sup> for 46.45	<sup>s</sup> read 46.41
513,	I., Inferior Conjunction	for south	read north
	S., Superior Conjunction	for north	read south
515,	Iapetus	for Feb. 30.9	read Jan. 30.9
519,	Feb. 19 0	for ♄ + 4 1	read ♄ + 4 1
	VI		

[Eph 10]



# CHRONOLOGICAL ERAS AND CYCLES.

## CHRONOLOGICAL ERAS.

THE YEAR 1910, WHICH COMPRISES THE LATTER PART OF THE 134TH AND THE BEGINNING OF THE 135TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6623 of the Julian Period;

- “ 7418–7419 of the Byzantine era, the year 7419 commencing on September 1;
- “ 5670–5671 of the Jewish era, the year 5671 commencing on October 4, or, more exactly, at sunset on October 3;
- “ 2663 since the foundation of Rome, according to VARRO;
- “ 2657 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period; corresponding, in the notation of chronologists, to the 747th, and, in the notation of astronomers, to the 746th year before the birth of CHRIST;
- “ 2686 of the Olympiads, or the second year of the 672d Olympiad, commencing in July, 1910, if we fix the era of the Olympiads at  $775\frac{1}{2}$  years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;
- “ 2222 of the Grecian era, or the era of the SELEUCIDÆ, which began near the vernal equinox of the year, — 311 = B. C. 312, = 4402 of the Julian Period;
- “ 1626 of the era of DIOCLETIAN;
- “ 2570 of the Japanese era and to the 43d year of the period entitled “Meiji.”

The year 1328 of the Mohammedan era, or the era of the Hegira, begins on the 13th day of January, 1910.

The first day of January of the year 1910 is the 2,418,673d day since the commencement of the Julian Period.

## CHRONOLOGICAL CYCLES.

Dominical Letter . . . . .	B	Solar Cycle . . . . .	15
Epact . . . . .	19	Roman Indiction . . . . .	8
Lunar Cycle or Golden Number . . . . .	11	Julian Period . . . . .	6623

## SYMBOLS AND ABBREVIATIONS.

### *SIGNS OF THE PLANETS, ETC.*

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
♁	The Earth.	♆	Neptune.

### *SIGNS OF THE ZODIAC.*

Spring Signs.	{	1.	♈	Aries.	•	Autumn Signs.	{	7.	♎	Libra.
		2.	♉	Taurus.				8.	♏	Scorpius.
		3.	♊	Gemini.				9.	♐	Sagittarius.
Summer Signs.	{	4.	♋	Cancer.		Winter Signs.	{	10.	♑	Capricornus.
		5.	♌	Leo.				11.	♒	Aquarius.
		6.	♍	Virgo.				12.	♓	Pisces.

### *ASPECTS.*

- ♌ Conjunction, or having the same Longitude or Right Ascension.
- ☐ Quadrature, or differing  $\pm 90^\circ$  in Longitude or Right Ascension.
- ♌ Opposition, or differing  $180^\circ$  in Longitude or Right Ascension.

### *ABBREVIATIONS.*

♊	Ascending Node.	°	Degrees.
♋	Descending Node.	'	Minutes of Arc.
N.	North.	"	Seconds of Arc.
S.	South.	h	Hours.
E.	East.	m	Minutes of Time.
W.	West.	s	Seconds of Time.

PART I

---

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF GREENWICH.

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>s</sup>	<sup>m</sup> <sup>s</sup>	<sup>s</sup>
Sat.	1	18 44 28.00	11.048	S. 23 3 29.5	+ 11.73	16 17.87	71.07	3 25.80	1.187
SUN.	2	18 48 53.00	11.035	22 58 34.2	12.89	16 17.86	71.02	3 54.16	1.175
Mon.	3	18 53 17.69	11.021	22 53 11.3	14.03	16 17.85	70.98	4 22.21	1.161
Tues.	4	18 57 42.02	11.006	22 47 21.1	+ 15.17	16 17.84	70.93	4 49.90	1.145
Wed.	5	19 2 5.96	10.990	22 41 3.7	16.30	16 17.82	70.87	5 17.21	1.128
Thur.	6	19 6 29.50	10.972	22 34 19.3	17.42	16 17.80	70.81	5 44.12	1.111
Frid.	7	19 10 52.60	10.953	22 27 8.0	+ 18.53	16 17.78	70.75	6 10.60	1.093
Sat.	8	19 15 15.23	10.933	22 19 30.2	19.64	16 17.75	70.68	6 36.61	1.073
SUN.	9	19 19 37.37	10.911	22 11 26.1	20.73	16 17.71	70.61	7 2.12	1.052
Mon.	10	19 23 58.98	10.888	22 2 55.8	+ 21.81	16 17.67	70.54	7 27.10	1.029
Tues.	11	19 28 20.02	10.865	21 53 59.5	22.89	16 17.63	70.46	7 51.53	1.005
Wed.	12	19 32 40.49	10.840	21 44 37.6	23.95	16 17.58	70.38	8 15.37	0.980
Thur.	13	19 37 0.36	10.814	21 34 50.4	+ 25.00	16 17.53	70.29	8 38.61	0.954
Frid.	14	19 41 19.57	10.787	21 24 38.1	26.04	16 17.48	70.21	9 1.21	0.927
Sat.	15	19 45 38.12	10.759	21 14 1.1	27.06	16 17.42	70.12	9 23.15	0.900
SUN.	16	19 49 56.00	10.730	21 2 59.6	+ 28.07	16 17.36	70.03	9 44.40	0.871
Mon.	17	19 54 13.17	10.700	20 51 34.0	29.07	16 17.29	69.93	10 4.95	0.842
Tues.	18	19 58 29.60	10.669	20 39 44.6	30.05	16 17.22	69.83	10 24.78	0.811
Wed.	19	20 2 45.29	10.638	20 27 31.7	+ 31.02	16 17.15	69.73	10 43.87	0.779
Thur.	20	20 7 0.24	10.606	20 14 55.8	31.98	16 17.07	69.63	11 2.20	0.747
Frid.	21	20 11 14.42	10.574	20 1 57.1	32.92	16 16.98	69.53	11 19.76	0.715
Sat.	22	20 15 27.81	10.542	19 48 36.0	+ 33.85	16 16.89	69.43	11 36.55	0.683
SUN.	23	20 19 40.41	10.509	19 34 52.8	34.76	16 16.79	69.32	11 52.56	0.650
Mon.	24	20 23 52.24	10.476	19 20 48.0	35.65	16 16.68	69.21	12 7.78	0.617
Tues.	25	20 28 3.27	10.442	19 6 21.8	+ 36.53	16 16.57	69.10	12 22.20	0.584
Wed.	26	20 32 13.50	10.409	18 51 34.7	37.39	16 16.46	68.99	12 35.83	0.551
Thur.	27	20 36 22.93	10.376	18 36 27.0	38.25	16 16.34	68.88	12 48.67	0.518
Frid.	28	20 40 31.56	10.343	18 20 59.1	+ 39.08	16 16.21	68.77	13 0.71	0.485
Sat.	29	20 44 39.39	10.309	18 5 11.3	39.90	16 16.07	68.65	13 11.95	0.451
SUN.	30	20 48 46.40	10.276	17 49 4.1	40.71	16 15.94	68.54	13 22.38	0.418
Mon.	31	20 52 52.60	10.243	17 32 37.8	41.51	16 15.80	68.42	13 32.01	0.384
Tues.	32	20 56 58.01	10.208	S. 17 15 52.8	+ 42.28	16 15.65	68.31	13 40.84	0.351

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0<sup>s</sup>.19 from the sidereal time.  
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Sat.	1	18 44 27.37	11.044	S. 23 3 30.2	+ 11.73	3 25.73	1.187	18 41 1.64
SUN.	2	18 48 52.28	11.032	22 58 35.0	12.88	3 54.08	1.175	18 44 58.20
Mon.	3	18 53 16.88	11.018	22 53 12.3	14.02	4 22.12	1.161	18 48 54.76
Tues.	4	18 57 41.12	11.002	22 47 22.3	+ 15.15	4 49.80	1.145	18 52 51.32
Wed.	5	19 2 4.98	10.985	22 41 5.1	16.28	5 17.10	1.129	18 56 47.88
Thur.	6	19 6 28.44	10.968	22 34 20.9	17.40	5 44.00	1.111	19 0 44.44
Frid.	7	19 10 51.46	10.950	22 27 9.9	+ 18.51	6 10.46	1.093	19 4 41.00
Sat.	8	19 15 14.02	10.930	22 19 32.4	19.62	6 36.47	1.073	19 8 37.55
SUN.	9	19 19 36.09	10.908	22 11 28.5	20.71	7 1.98	1.052	19 12 34.11
Mon.	10	19 23 57.62	10.885	22 2 58.5	+ 21.79	7 26.95	1.029	19 16 30.67
Tues.	11	19 28 18.59	10.862	21 54 2.6	22.87	7 51.37	1.005	19 20 27.23
Wed.	12	19 32 38.99	10.837	21 44 41.0	23.93	8 15.20	0.980	19 24 23.79
Thur.	13	19 36 58.79	10.811	21 34 54.0	+ 24.98	8 38.44	0.954	19 28 20.35
Frid.	14	19 41 17.94	10.784	21 24 42.0	26.02	9 1.03	0.927	19 32 16.91
Sat.	15	19 45 36.43	10.756	21 14 5.3	27.05	9 22.96	0.900	19 36 13.47
SUN.	16	19 49 54.25	10.727	21 3 4.1	+ 28.06	9 44.23	0.871	19 40 10.02
Mon.	17	19 54 11.36	10.698	20 51 38.9	29.05	10 4.78	0.842	19 44 6.58
Tues.	18	19 58 27.74	10.667	20 39 49.8	30.03	10 24.61	0.811	19 48 3.13
Wed.	19	20 2 43.38	10.636	20 27 37.3	+ 31.00	10 43.69	0.779	19 51 59.69
Thur.	20	20 6 58.28	10.604	20 15 1.7	31.96	11 2.03	0.747	19 55 56.25
Frid.	21	20 11 12.41	10.572	20 2 3.4	32.90	11 19.61	0.715	19 59 52.80
Sat.	22	20 15 25.76	10.540	19 48 42.6	+ 33.83	11 36.41	0.683	20 3 49.36
SUN.	23	20 19 38.33	10.508	19 34 59.7	34.75	11 52.42	0.650	20 7 45.92
Mon.	24	20 23 50.11	10.474	19 20 55.2	35.64	12 7.64	0.617	20 11 42.48
Tues.	25	20 28 1.11	10.441	19 6 29.4	+ 36.52	12 22.07	0.584	20 15 39.04
Wed.	26	20 32 11.31	10.408	18 51 42.6	37.38	12 35.71	0.551	20 19 35.60
Thur.	27	20 36 20.71	10.375	18 36 35.2	38.23	12 48.55	0.518	20 23 32.15
Frid.	28	20 40 29.31	10.342	18 21 7.6	+ 39.07	13 0.60	0.485	20 27 28.70
Sat.	29	20 44 37.11	10.309	18 5 20.1	39.89	13 11.85	0.451	20 31 25.26
SUN.	30	20 48 44.10	10.275	17 49 13.2	40.69	13 22.29	0.418	20 35 21.82
Mon.	31	20 52 50.29	10.241	17 32 47.2	41.48	13 31.92	0.384	20 39 18.37
Tues.	32	20 56 55.68	10.207	S. 17 16 2.5	+ 42.25	13 40.75	0.351	20 43 14.93

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,  
+ 9<sup>h</sup> 85<sup>m</sup> 56<sup>s</sup>.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	1	280 13 18.9	13 34.0	152.88	+ 0.14	9.992 6689	0.0	5 18 6.10
2	2	281 14 28.1	14 43.0	152.89	0.10	9.992 6703	+ 1.0	5 14 10.18
3	3	282 15 37.5	15 52.2	152.90	+ 0.05	9.992 6740	2.0	5 10 14.27
4	4	283 16 47.2	17 1.7	152.91	— 0.03	9.992 6799	+ 2.9	5 6 18.36
5	5	284 17 57.1	18 11.4	152.91	0.13	9.992 6880	3.8	5 2 22.45
6	6	285 19 7.1	19 21.2	152.92	0.25	9.992 6982	4.7	4 58 26.54
7	7	286 20 17.2	20 31.1	152.92	— 0.37	9.992 7103	+ 5.5	4 54 30.63
8	8	287 21 27.2	21 41.0	152.92	0.49	9.992 7243	6.2	4 50 34.71
9	9	288 22 37.3	22 50.8	152.92	0.61	9.992 7401	6.9	4 46 38.80
10	10	289 23 47.2	24 0.5	152.91	— 0.73	9.992 7576	+ 7.6	4 42 42.89
11	11	290 24 56.8	25 10.0	152.90	0.83	9.992 7767	8.3	4 38 46.98
12	12	291 26 6.1	26 19.2	152.88	0.91	9.992 7974	9.0	4 34 51.06
13	13	292 27 15.0	27 27.9	152.86	— 0.97	9.992 8197	+ 9.7	4 30 55.15
14	14	293 28 23.3	28 36.0	152.83	1.00	9.992 8437	10.5	4 26 59.23
15	15	294 29 31.0	29 43.4	152.80	0.99	9.992 8694	11.3	4 23 3.32
16	16	295 30 37.9	30 50.1	152.77	— 0.94	9.992 8969	+ 11.9	4 19 7.41
17	17	296 31 44.0	31 56.1	152.74	0.87	9.992 9262	12.6	4 15 11.50
18	18	297 32 49.2	33 1.2	152.70	0.78	9.992 9576	13.5	4 11 15.59
19	19	298 33 53.5	34 5.4	152.66	— 0.66	9.992 9911	+ 14.5	4 7 19.68
20	20	299 34 56.9	35 8.6	152.62	0.52	9.993 0270	15.5	4 3 23.77
21	21	300 35 59.4	36 10.8	152.58	0.37	9.993 0653	16.5	3 59 27.86
22	22	301 37 0.9	37 12.1	152.54	— 0.24	9.993 1061	+ 17.5	3 55 31.95
23	23	302 38 1.4	38 12.5	152.50	— 0.12	9.993 1495	18.6	3 51 36.04
24	24	303 39 1.0	39 11.9	152.47	0.00	9.993 1956	19.8	3 47 40.12
25	25	304 39 59.7	40 10.5	152.44	+ 0.08	9.993 2444	+ 20.9	3 43 44.21
26	26	305 40 57.7	41 8.3	152.40	0.15	9.993 2958	22.0	3 39 48.30
27	27	306 41 54.8	42 5.2	152.37	0.17	9.993 3499	23.1	3 35 52.39
28	28	307 42 51.1	43 1.4	152.33	+ 0.18	9.993 4065	+ 24.1	3 31 56.48
29	29	308 43 46.6	43 56.7	152.30	0.16	9.993 4656	25.1	3 28 0.57
30	30	309 44 41.3	44 51.3	152.27	0.10	9.993 5270	26.1	3 24 4.66
31	31	310 45 35.2	45 45.1	152.23	+ 0.03	9.993 5907	26.9	3 20 8.75
32	32	311 46 28.4	46 38.1	152.20	— 0.06	9.993 6565	+ 27.8	3 16 12.84
NOTE.—The numbers in column $\lambda$ correspond to the true equinox of the date; in column $\lambda'$ to the mean equinox of January 0 <sup>h</sup> .0.								Diff. for 1 Hour, — 9 <sup>h</sup> .8296. (Table II.)

## GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S									
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.	
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.	
	"	"	"	"	"	"	h m	m	d	
1	14 58.9	14 55.4	54 53.0	- 1.17	54 40.0	- 0.98	17 10.3	1.70	19.7	
2	14 52.5	14 50.3	54 29.5	0.77	54 21.5	0.56	17 50.5	1.66	20.7	
3	14 48.8	14 48.0	54 16.1	- 0.34	54 13.4	- 0.12	18 30.3	1.66	21.7	
4	14 48.0	14 48.7	54 13.3	+ 0.10	54 15.8	+ 0.32	19 10.8	1.71	22.7	
5	14 50.1	14 52.2	54 20.9	0.53	54 28.4	0.72	19 53.0	1.81	23.7	
6	14 54.9	14 58.1	54 38.3	0.90	54 50.2	1.07	20 38.0	1.94	24.7	
7	15 1.9	15 6.1	55 4.0	+ 1.22	55 19.5	+ 1.34	21 26.4	2.10	25.7	
8	15 10.6	15 15.5	55 36.2	1.44	55 54.0	1.51	22 18.6	2.25	26.7	
9	15 20.6	15 25.7	56 12.6	1.55	56 31.4	1.57	23 13.9	2.35	27.7	
10	15 30.8	15 35.9	56 50.3	+ 1.56	57 8.9	+ 1.52	. . .	. .	28.7	
11	15 40.8	15 45.4	57 26.9	1.46	57 43.9	1.37	0 11.0	2.40	0.0	
12	15 49.7	15 53.7	57 59.8	1.26	58 14.3	1.15	1 8.1	2.35	1.0	
13	15 57.3	16 0.4	58 27.3	+ 1.02	58 38.7	+ 0.88	2 3.7	2.27	2.0	
14	16 3.0	16 5.2	58 48.3	0.73	58 56.3	0.60	2 56.9	2.16	3.0	
15	16 6.9	16 8.2	59 2.7	0.47	59 7.5	0.34	3 47.7	2.08	4.0	
16	16 9.1	16 9.7	59 10.9	+ 0.22	59 12.9	+ 0.11	4 36.9	2.03	5.0	
17	16 9.9	16 9.8	59 13.6	+ 0.01	59 13.2	- 0.09	5 25.5	2.03	6.0	
18	16 9.4	16 8.7	59 11.6	- 0.18	59 9.0	- 0.26	6 14.7	2.08	7.0	
19	16 7.7	16 6.4	59 5.3	- 0.35	59 0.6	- 0.44	7 5.7	2.17	8.0	
20	16 4.8	16 2.9	58 54.8	0.53	58 47.9	0.63	7 59.3	2.29	9.0	
21	16 0.7	15 58.2	58 39.8	0.72	58 30.5	0.83	8 55.7	2.40	10.0	
22	15 55.3	15 52.1	58 20.0	- 0.93	58 8.2	- 1.03	9 54.2	2.46	11.0	
23	15 48.6	15 44.8	57 55.3	1.13	57 41.2	1.22	10 53.1	2.43	12.0	
24	15 40.7	15 36.3	57 26.1	1.30	57 10.1	1.36	11 50.4	2.32	13.0	
25	15 31.7	15 27.0	56 53.4	- 1.41	56 36.2	- 1.44	12 44.4	2.17	14.0	
26	15 22.3	15 17.6	56 18.8	1.45	56 1.5	1.43	13 34.6	2.00	15.0	
27	15 13.0	15 8.5	55 44.6	1.39	55 28.2	1.32	14 20.9	1.86	16.0	
28	15 4.3	15 0.5	55 12.8	- 1.23	54 58.7	- 1.12	15 4.2	1.76	17.0	
29	14 57.1	14 54.1	54 46.0	0.99	54 35.0	0.84	15 45.4	1.68	18.0	
30	14 51.6	14 49.7	54 26.0	0.66	54 19.2	0.47	16 25.5	1.66	19.0	
31	14 48.5	14 48.0	54 14.7	- 0.27	54 12.7	- 0.06	17 5.6	1.69	20.0	
32	14 48.1	14 48.9	54 13.2	+ 0.15	54 16.3	+ 0.37	17 46.8	1.76	21.0	

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 1.					MONDAY 3.				
0	11 22 31.10	1.8712	N. 9 36 9.4	12.427	0	12 49 21.51	1.7755	S. 0 38 53.8	12.937
1	11 24 23.25	1.8674	9 23 42.9	12.455	1	12 51 8.04	1.7753	0 51 49.9	12.932
2	11 26 15.18	1.8637	9 11 14.8	12.482	2	12 52 54.55	1.7752	1 4 45.6	12.926
3	11 28 6.90	1.8601	8 58 45.1	12.508	3	12 54 41.06	1.7752	1 17 41.0	12.919
4	11 29 58.41	1.8567	8 46 13.9	12.533	4	12 56 27.57	1.7752	1 30 36.0	12.912
5	11 31 49.71	1.8533	8 33 41.2	12.557	5	12 58 14.09	1.7753	1 43 30.5	12.904
6	11 33 40.80	1.8499	8 21 7.1	12.581	6	13 0 0.61	1.7755	1 56 24.5	12.895
7	11 35 31.70	1.8466	8 8 31.6	12.604	7	13 1 47.15	1.7757	2 9 18.0	12.886
8	11 37 22.40	1.8434	7 55 54.7	12.626	8	13 3 33.70	1.7760	2 22 10.9	12.876
9	11 39 12.91	1.8403	7 43 16.5	12.647	9	13 5 20.28	1.7765	2 35 3.3	12.866
10	11 41 3.23	1.8372	7 30 37.1	12.668	10	13 7 6.88	1.7770	2 47 55.0	12.855
11	11 42 53.38	1.8342	7 17 56.4	12.688	11	13 8 53.51	1.7775	3 0 46.0	12.844
12	11 44 43.34	1.8313	7 5 14.6	12.707	12	13 10 40.18	1.7781	3 13 36.3	12.832
13	11 46 33.13	1.8285	6 52 31.7	12.725	13	13 12 26.89	1.7788	3 26 25.9	12.819
14	11 48 22.76	1.8257	6 39 47.7	12.743	14	13 14 13.64	1.7795	3 39 14.7	12.806
15	11 50 12.22	1.8230	6 27 2.7	12.760	15	13 16 0.43	1.7804	3 52 2.7	12.792
16	11 52 1.52	1.8204	6 14 16.7	12.776	16	13 17 47.28	1.7813	4 4 49.8	12.778
17	11 53 50.67	1.8179	6 1 29.7	12.791	17	13 19 34.19	1.7822	4 17 36.0	12.763
18	11 55 39.66	1.8154	5 48 41.8	12.806	18	13 21 21.15	1.7833	4 30 21.3	12.747
19	11 57 28.51	1.8130	5 35 53.1	12.820	19	13 23 8.18	1.7844	4 43 5.7	12.731
20	11 59 17.22	1.8107	5 23 3.5	12.833	20	13 24 55.28	1.7856	4 55 49.1	12.714
21	12 1 5.79	1.8084	5 10 13.1	12.845	21	13 26 42.45	1.7868	5 8 31.4	12.696
22	12 2 54.23	1.8062	4 57 22.0	12.857	22	13 28 29.70	1.7882	5 21 12.6	12.678
23	12 4 42.54	1.8041	N. 4 44 30.2	12.868	23	13 30 17.03	1.7896	S. 5 33 52.7	12.659
SUNDAY 2.					TUESDAY 4.				
0	12 6 30.72	1.8020	N. 4 31 37.8	12.879	0	13 32 4.44	1.7911	S. 5 46 31.6	12.640
1	12 8 18.78	1.8000	4 18 44.8	12.889	1	13 33 51.95	1.7927	5 59 9.4	12.620
2	12 10 6.73	1.7981	4 5 51.2	12.898	2	13 35 39.56	1.7943	6 11 45.9	12.599
3	12 11 54.57	1.7963	3 52 57.1	12.906	3	13 37 27.27	1.7960	6 24 21.2	12.578
4	12 13 42.30	1.7946	3 40 2.5	12.914	4	13 39 15.08	1.7977	6 36 55.2	12.556
5	12 15 29.93	1.7930	3 27 7.4	12.921	5	13 41 2.99	1.7995	6 49 27.8	12.533
6	12 17 17.47	1.7915	3 14 11.9	12.928	6	13 42 51.01	1.8014	7 1 59.1	12.510
7	12 19 4.91	1.7900	3 1 16.1	12.934	7	13 44 39.15	1.8033	7 14 28.9	12.486
8	12 20 52.27	1.7886	2 48 19.9	12.939	8	13 46 27.41	1.8053	7 26 57.3	12.461
9	12 22 39.54	1.7873	2 35 23.4	12.944	9	13 48 15.79	1.8074	7 39 24.2	12.435
10	12 24 26.73	1.7860	2 22 26.6	12.948	10	13 50 4.30	1.8096	7 51 49.5	12.409
11	12 26 13.84	1.7847	2 9 29.6	12.951	11	13 51 52.95	1.8119	8 4 13.2	12.382
12	12 28 0.89	1.7835	1 56 32.4	12.954	12	13 53 41.73	1.8142	8 16 35.4	12.355
13	12 29 47.87	1.7824	1 43 35.1	12.956	13	13 55 30.65	1.8166	8 28 55.9	12.327
14	12 31 34.78	1.7814	1 30 37.7	12.957	14	13 57 19.72	1.8191	8 41 14.7	12.298
15	12 33 21.64	1.7805	1 17 40.2	12.958	15	13 59 8.94	1.8216	8 53 31.7	12.269
16	12 35 8.45	1.7797	1 4 42.7	12.958	16	14 0 58.31	1.8242	9 5 46.9	12.239
17	12 36 55.21	1.7789	0 51 45.2	12.958	17	14 2 47.84	1.8268	9 18 0.3	12.208
18	12 38 41.92	1.7782	0 38 47.8	12.957	18	14 4 37.53	1.8295	9 30 11.8	12.176
19	12 40 28.59	1.7776	0 25 50.5	12.955	19	14 6 27.38	1.8323	9 42 21.4	12.144
20	12 42 15.23	1.7770	N. 0 12 53.3	12.953	20	14 8 17.40	1.8351	9 54 29.1	12.111
21	12 44 1.83	1.7765	S. 0 0 3.8	12.950	21	14 10 7.59	1.8380	10 6 34.8	12.077
22	12 45 48.41	1.7761	0 13 0.7	12.946	22	14 11 57.96	1.8410	10 18 38.4	12.043
23	12 47 34.97	1.7758	0 25 57.4	12.942	23	14 13 48.51	1.8441	10 30 39.9	12.008
24	12 49 21.51	1.7755	S. 0 38 53.8	12.937	24	14 15 39.25	1.8472	S. 10 42 39.3	11.972



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 5.					FRIDAY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 15 39.25	1.8472	S. 10 42 39.3	11.972	0	15 49 3.23	2.0645	S. 19 20 23.8	9.253
1	14 17 30.18	1.8504	10 54 36.5	11.935	1	15 51 7.27	2.0701	19 29 36.6	9.173
2	14 19 21.30	1.8536	11 6 31.5	11.898	2	15 53 11.65	2.0758	19 38 44.5	9.092
3	14 21 12.61	1.8569	11 18 24.3	11.860	3	15 55 16.37	2.0815	19 47 47.5	9.010
4	14 23 4.12	1.8603	11 30 14.8	11.821	4	15 57 21.43	2.0872	19 56 45.6	8.926
5	14 24 55.84	1.8638	11 42 2.8	11.781	5	15 59 26.84	2.0929	20 5 38.7	8.842
6	14 26 47.78	1.8673	11 53 48.4	11.741	6	16 1 32.59	2.0987	20 14 26.6	8.756
7	14 28 39.93	1.8709	12 5 31.6	11.700	7	16 3 38.69	2.1044	20 23 9.3	8.669
8	14 30 32.29	1.8745	12 17 12.3	11.658	8	16 5 45.14	2.1102	20 31 46.8	8.581
9	14 32 24.86	1.8782	12 28 50.5	11.615	9	16 7 51.93	2.1160	20 40 19.0	8.492
10	14 34 17.66	1.8819	12 40 26.1	11.571	10	16 9 59.07	2.1219	20 48 45.9	8.402
11	14 36 10.69	1.8857	12 51 59.1	11.526	11	16 12 6.57	2.1278	20 57 7.3	8.311
12	14 38 3.95	1.8896	13 3 29.3	11.481	12	16 14 14.41	2.1336	21 5 23.2	8.219
13	14 39 57.45	1.8936	13 14 56.8	11.435	13	16 16 22.61	2.1395	21 13 33.5	8.125
14	14 41 51.18	1.8976	13 26 21.5	11.388	14	16 18 31.16	2.1454	21 21 38.2	8.031
15	14 43 45.15	1.9017	13 37 43.4	11.340	15	16 20 40.06	2.1513	21 29 37.1	7.935
16	14 45 39.37	1.9058	13 49 2.4	11.291	16	16 22 49.32	2.1572	21 37 30.3	7.838
17	14 47 33.84	1.9100	14 0 18.5	11.242	17	16 24 58.92	2.1631	21 45 17.7	7.740
18	14 49 28.57	1.9142	14 11 31.5	11.192	18	16 27 8.88	2.1689	21 52 59.1	7.641
19	14 51 23.55	1.9185	14 22 41.5	11.141	19	16 29 19.19	2.1748	22 0 34.6	7.541
20	14 53 18.78	1.9228	14 33 48.5	11.089	20	16 31 29.86	2.1807	22 8 4.0	7.440
21	14 55 14.28	1.9272	14 44 52.3	11.036	21	16 33 40.88	2.1866	22 15 27.3	7.337
22	14 57 10.05	1.9317	14 55 52.9	10.982	22	16 35 52.25	2.1924	22 22 44.4	7.234
23	14 59 6.09	1.9362	S. 15 6 50.3	10.928	23	16 38 3.97	2.1983	S. 22 29 55.3	7.129
THURSDAY 6.					SATURDAY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 1 2.39	1.9408	S. 15 17 44.3	10.873	0	16 40 16.04	2.2041	S. 22 36 59.9	7.023
1	15 2 58.97	1.9454	15 28 35.0	10.817	1	16 42 28.47	2.2100	22 43 58.1	6.926
2	15 4 55.83	1.9501	15 39 22.3	10.760	2	16 44 41.25	2.2158	22 50 49.8	6.828
3	15 6 52.98	1.9548	15 50 6.2	10.701	3	16 46 54.37	2.2217	22 57 35.0	6.699
4	15 8 50.41	1.9596	16 0 46.6	10.642	4	16 49 7.84	2.2275	23 4 13.6	6.588
5	15 10 48.13	1.9644	16 11 23.3	10.582	5	16 51 21.66	2.2333	23 10 45.5	6.477
6	15 12 46.14	1.9693	16 21 56.3	10.521	6	16 53 35.83	2.2390	23 17 10.7	6.364
7	15 14 44.44	1.9742	16 32 25.6	10.459	7	16 55 50.34	2.2447	23 23 29.1	6.250
8	15 16 43.04	1.9792	16 42 51.2	10.397	8	16 58 5.20	2.2504	23 29 40.6	6.135
9	15 18 41.94	1.9842	16 53 13.1	10.333	9	17 0 20.39	2.2561	23 35 45.2	6.019
10	15 20 41.15	1.9893	17 3 31.2	10.268	10	17 2 35.93	2.2617	23 41 42.8	5.901
11	15 22 40.66	1.9944	17 13 45.3	10.202	11	17 4 51.80	2.2673	23 47 33.4	5.783
12	15 24 40.47	1.9996	17 23 55.3	10.135	12	17 7 8.00	2.2729	23 53 16.8	5.663
13	15 26 40.60	2.0048	17 34 1.3	10.067	13	17 9 24.54	2.2784	23 58 53.0	5.542
14	15 28 41.04	2.0100	17 44 3.3	9.998	14	17 11 41.41	2.2839	24 4 22.0	5.421
15	15 30 41.80	2.0153	17 54 1.1	9.928	15	17 13 58.61	2.2894	24 9 43.6	5.298
16	15 32 42.88	2.0206	18 3 54.7	9.857	16	17 16 16.14	2.2948	24 14 57.8	5.175
17	15 34 44.28	2.0260	18 13 44.0	9.785	17	17 18 33.98	2.3002	24 20 4.6	5.050
18	15 36 46.00	2.0314	18 23 28.9	9.712	18	17 20 52.15	2.3055	24 25 3.9	4.924
19	15 38 48.05	2.0369	18 33 9.4	9.638	19	17 23 10.64	2.3108	24 29 55.6	4.797
20	15 40 50.43	2.0424	18 42 45.5	9.563	20	17 25 29.44	2.3159	24 34 39.6	4.670
21	15 42 53.13	2.0479	18 52 17.0	9.487	21	17 27 48.55	2.3211	24 39 16.0	4.541
22	15 44 56.16	2.0534	19 1 43.9	9.410	22	17 30 7.96	2.3262	24 43 44.6	4.411
23	15 46 59.53	2.0589	19 11 6.2	9.332	23	17 32 27.68	2.3312	24 48 5.3	4.280
24	15 49 3.23	2.0645	S. 19 20 23.8	9.253	24	17 34 47.70	2.3362	S. 24 52 18.2	4.148

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 9.					TUESDAY 11.				
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	17 34 47.70	2.3362	S. 24 52 18.2	4.148	0	19 31 0.06	2.4656	S. 25 24 21.8	3.015
1	17 37 8.02	2.3411	24 56 23.1	4.015	1	19 33 28.00	2.4656	25 21 16.2	3.172
2	17 39 28.63	2.3459	25 0 20.0	3.881	2	19 35 55.94	2.4655	25 18 1.2	3.329
3	17 41 49.52	2.3507	25 4 8.8	3.746	3	19 38 23.86	2.4653	25 14 36.7	3.486
4	17 44 10.70	2.3554	25 7 49.5	3.610	4	19 40 51.76	2.4649	25 11 2.9	3.642
5	17 46 32.16	2.3600	25 11 22.1	3.473	5	19 43 19.64	2.4644	25 7 19.7	3.798
6	17 48 53.89	2.3645	25 14 46.4	3.335	6	19 45 47.49	2.4638	25 3 27.1	3.954
7	17 51 15.90	2.3690	25 18 2.4	3.196	7	19 48 15.30	2.4631	24 59 25.2	4.110
8	17 53 38.17	2.3734	25 21 10.1	3.057	8	19 50 43.06	2.4623	24 55 13.9	4.266
9	17 56 0.70	2.3777	25 24 9.4	2.917	9	19 53 10.77	2.4614	24 50 53.3	4.421
10	17 58 23.48	2.3819	25 27 0.2	2.776	10	19 55 38.43	2.4603	24 46 23.3	4.576
11	18 0 46.52	2.3860	25 29 42.5	2.634	11	19 58 6.01	2.4592	24 41 44.1	4.730
12	18 3 9.80	2.3900	25 32 16.3	2.491	12	20 0 33.53	2.4580	24 36 55.7	4.884
13	18 5 33.32	2.3939	25 34 41.4	2.347	13	20 3 0.97	2.4566	24 31 58.0	5.038
14	18 7 57.08	2.3978	25 36 57.9	2.203	14	20 5 28.32	2.4552	24 26 51.1	5.191
15	18 10 21.07	2.4016	25 39 5.8	2.058	15	20 7 55.58	2.4536	24 21 35.0	5.344
16	18 12 45.28	2.4053	25 41 4.9	1.912	16	20 10 22.75	2.4520	24 16 9.8	5.496
17	18 15 9.70	2.4089	25 42 55.2	1.765	17	20 12 49.81	2.4502	24 10 35.5	5.648
18	18 17 34.34	2.4124	25 44 36.7	1.618	18	20 15 16.77	2.4483	24 4 52.1	5.799
19	18 19 59.19	2.4158	25 46 9.3	1.470	19	20 17 43.61	2.4464	23 58 59.7	5.949
20	18 22 24.23	2.4190	25 47 33.0	1.321	20	20 20 10.33	2.4443	23 52 58.2	6.099
21	18 24 49.47	2.4222	25 48 47.8	1.172	21	20 22 36.93	2.4422	23 46 47.8	6.248
22	18 27 14.90	2.4253	25 49 53.6	1.022	22	20 25 3.40	2.4400	23 40 28.4	6.397
23	18 29 40.51	2.4283	S. 25 50 50.4	0.871	23	20 27 29.73	2.4377	S. 23 34 0.2	6.545
MONDAY 10.					WEDNESDAY 12.				
0	18 32 6.29	2.4312	S. 25 51 38.2	0.720	0	20 29 55.92	2.4353	S. 23 27 23.1	6.692
1	18 34 32.24	2.4339	25 52 16.8	0.568	1	20 32 21.96	2.4339	23 20 37.2	6.838
2	18 36 58.36	2.4366	25 52 46.3	0.416	2	20 34 47.86	2.4303	23 13 42.5	6.984
3	18 39 24.63	2.4391	25 53 6.7	0.263	3	20 37 13.60	2.4277	23 6 39.1	7.129
4	18 41 51.05	2.4415	25 53 17.9	-0.110	4	20 39 39.18	2.4250	22 59 27.1	7.273
5	18 44 17.61	2.4439	25 53 19.8	+0.044	5	20 42 4.59	2.4222	22 52 6.4	7.416
6	18 46 44.31	2.4461	25 53 12.5	0.199	6	20 44 29.84	2.4194	22 44 37.2	7.558
7	18 49 11.14	2.4481	25 52 55.9	0.353	7	20 46 54.91	2.4164	22 36 59.5	7.699
8	18 51 38.09	2.4501	25 52 30.1	0.508	8	20 49 19.81	2.4134	22 29 13.3	7.840
9	18 54 5.15	2.4520	25 51 55.0	0.663	9	20 51 44.52	2.4103	22 21 18.7	7.980
10	18 56 32.32	2.4537	25 51 10.5	0.818	10	20 54 9.05	2.4072	22 13 15.8	8.118
11	18 58 59.59	2.4553	25 50 16.7	0.974	11	20 56 33.39	2.4040	22 5 4.6	8.256
12	19 1 26.95	2.4568	25 49 13.5	1.130	12	20 58 57.54	2.4008	21 56 45.2	8.392
13	19 3 54.40	2.4582	25 48 1.0	1.287	13	21 1 21.49	2.3975	21 48 17.6	8.528
14	19 6 21.93	2.4594	25 46 39.1	1.443	14	21 3 45.24	2.3941	21 39 41.9	8.663
15	19 8 49.54	2.4606	25 45 7.8	1.600	15	21 6 8.78	2.3907	21 30 58.1	8.796
16	19 11 17.21	2.4616	25 43 27.0	1.757	16	21 8 32.12	2.3872	21 22 6.3	8.929
17	19 13 44.93	2.4625	25 41 36.9	1.914	17	21 10 55.25	2.3837	21 13 6.6	9.060
18	19 16 12.71	2.4633	25 39 37.3	2.071	18	21 13 18.17	2.3802	21 3 59.1	9.191
19	19 18 40.53	2.4640	25 37 28.3	2.228	19	21 15 40.87	2.3766	20 54 43.8	9.320
20	19 21 8.39	2.4646	25 35 9.9	2.386	20	21 18 3.36	2.3730	20 45 20.7	9.448
21	19 23 36.28	2.4650	25 32 42.0	2.543	21	21 20 25.63	2.3693	20 35 50.0	9.575
22	19 26 4.19	2.4653	25 30 4.7	2.700	22	21 22 47.68	2.3656	20 26 11.7	9.701
23	19 28 32.12	2.4655	25 27 18.0	2.858	23	21 25 9.51	2.3619	20 16 25.9	9.826
24	19 31 0.06	2.4656	S. 25 24 21.8	3.015	24	21 27 31.11	2.3581	S. 20 6 32.6	9.949

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 13.					SATURDAY 15.				
0	21 27 31.11	2.3581	S. 20 6 32.6	9.949	0	23 16 17.51	2.1819	S. 10 11 29.0	14.314
1	21 29 52.48	2.3543	19 56 32.0	10.072	1	23 18 28.34	2.1791	9 57 8.5	14.371
2	21 32 13.62	2.3504	19 46 24.0	10.193	2	23 20 39.00	2.1763	9 42 44.6	14.426
3	21 34 34.54	2.3466	19 36 8.8	10.312	3	23 22 49.50	2.1736	9 28 17.5	14.479
4	21 36 55.22	2.3427	19 25 46.5	10.431	4	23 24 59.83	2.1709	9 13 47.2	14.531
5	21 39 15.67	2.3388	19 15 17.1	10.548	5	23 27 10.01	2.1683	8 59 13.8	14.582
6	21 41 35.88	2.3349	19 4 40.7	10.665	6	23 29 20.03	2.1658	8 44 37.4	14.631
7	21 43 55.86	2.3310	18 53 57.3	10.780	7	23 31 29.90	2.1633	8 29 58.1	14.679
8	21 46 15.60	2.3271	18 43 7.1	10.893	8	23 33 39.63	2.1609	8 15 16.0	14.725
9	21 48 35.10	2.3231	18 32 10.1	11.006	9	23 35 49.21	2.1585	8 0 31.1	14.770
10	21 50 54.37	2.3191	18 21 6.5	11.117	10	23 37 58.65	2.1562	7 45 43.5	14.814
11	21 53 13.41	2.3152	18 9 56.2	11.227	11	23 40 7.96	2.1540	7 30 53.4	14.856
12	21 55 32.20	2.3112	17 58 39.3	11.335	12	23 42 17.14	2.1519	7 16 0.8	14.897
13	21 57 50.75	2.3073	17 47 16.0	11.442	13	23 44 26.19	2.1498	7 1 5.8	14.936
14	22 0 9.07	2.3033	17 35 46.3	11.548	14	23 46 35.12	2.1478	6 46 8.5	14.974
15	22 2 27.15	2.2993	17 24 10.3	11.653	15	23 48 43.92	2.1458	6 31 9.0	15.010
16	22 4 45.00	2.2954	17 12 28.1	11.756	16	23 50 52.62	2.1439	6 16 7.3	15.045
17	22 7 2.60	2.2914	17 0 39.7	11.858	17	23 53 1.20	2.1421	6 1 3.6	15.079
18	22 9 19.97	2.2875	16 48 45.3	11.958	18	23 55 9.67	2.1403	5 45 57.9	15.111
19	22 11 37.10	2.2835	16 36 44.9	12.057	19	23 57 18.04	2.1386	5 30 50.3	15.142
20	22 13 53.99	2.2796	16 24 38.5	12.155	20	23 59 26.31	2.1370	5 15 40.9	15.172
21	22 16 10.65	2.2757	16 12 26.4	12.251	21	0 1 34.48	2.1355	5 0 29.7	15.200
22	22 18 27.08	2.2718	16 0 8.5	12.346	22	0 3 42.57	2.1340	4 45 16.9	15.226
23	22 20 43.27	2.2679	S. 15 47 45.0	12.439	23	0 5 50.57	2.1326	S. 4 30 2.6	15.251
FRIDAY 14.					SUNDAY 16.				
0	22 22 59.23	2.2641	S. 15 35 15.9	12.531	0	0 7 58.49	2.1313	S. 4 14 46.8	15.275
1	22 25 14.96	2.2603	15 22 41.4	12.621	1	0 10 6.33	2.1301	3 59 29.6	15.297
2	22 27 30.46	2.2565	15 10 1.4	12.710	2	0 12 14.10	2.1289	3 44 11.2	15.318
3	22 29 45.74	2.2527	14 57 16.1	12.798	3	0 14 21.81	2.1278	3 28 51.5	15.338
4	22 32 0.79	2.2489	14 44 25.6	12.885	4	0 16 29.45	2.1268	3 13 30.7	15.356
5	22 34 15.61	2.2452	14 31 30.0	12.970	5	0 18 37.03	2.1259	2 58 8.8	15.373
6	22 36 30.21	2.2415	14 18 29.3	13.054	6	0 20 44.56	2.1251	2 42 46.0	15.388
7	22 38 44.59	2.2378	14 5 23.6	13.136	7	0 22 52.04	2.1243	2 27 22.3	15.402
8	22 40 58.75	2.2342	13 52 13.0	13.217	8	0 24 59.47	2.1236	2 11 57.8	15.415
9	22 43 12.69	2.2306	13 38 57.6	13.296	9	0 27 6.87	2.1230	1 56 32.6	15.426
10	22 45 26.41	2.2270	13 25 37.5	13.374	10	0 29 14.23	2.1224	1 41 6.7	15.436
11	22 47 39.92	2.2235	13 12 12.8	13.450	11	0 31 21.56	2.1219	1 25 40.3	15.444
12	22 49 53.23	2.2200	12 58 43.5	13.525	12	0 33 28.86	2.1215	1 10 13.4	15.451
13	22 52 6.33	2.2166	12 45 9.8	13.599	13	0 35 36.14	2.1212	0 54 46.1	15.457
14	22 54 19.22	2.2132	12 31 31.7	13.671	14	0 37 43.41	2.1210	0 39 18.6	15.461
15	22 56 31.91	2.2098	12 17 49.3	13.742	15	0 39 50.66	2.1208	0 23 50.8	15.464
16	22 58 44.40	2.2065	12 4 2.7	13.811	16	0 41 57.90	2.1207	S. 0 8 22.9	15.466
17	23 0 56.70	2.2032	11 50 12.0	13.879	17	0 44 5.14	2.1207	N. 0 7 5.1	15.466
18	23 3 8.80	2.2000	11 36 17.3	13.945	18	0 46 12.39	2.1208	0 22 33.0	15.465
19	23 5 20.71	2.1969	11 22 18.6	14.010	19	0 48 19.64	2.1209	0 38 0.8	15.462
20	23 7 32.43	2.1938	11 8 16.1	14.074	20	0 50 26.90	2.1211	0 53 28.4	15.458
21	23 9 43.97	2.1907	10 54 9.7	14.136	21	0 52 34.18	2.1214	1 8 55.7	15.453
22	23 11 55.33	2.1877	10 39 59.7	14.197	22	0 54 41.48	2.1218	1 24 22.7	15.446
23	23 14 6.51	2.1848	10 25 46.1	14.256	23	0 56 48.80	2.1223	1 39 49.2	15.438
24	23 16 17.51	2.1819	S. 10 11 29.0	14.314	24	0 58 56.15	2.1228	N. 1 55 15.2	15.428

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 17.					WEDNESDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	58 56.15	2.1228	N. 1 55 15.2	15.428	0	2 42 53.42	2.2352	N. 13 38 31.7	13.340
1	1 3 54	2.1234	2 10 40.6	15.417	1	2 45 7.65	2.2391	13 51 49.7	13.262
2	1 3 10.96	2.1241	2 26 5.3	15.405	2	2 47 22.11	2.2430	14 5 3.0	13.183
3	1 5 18.43	2.1249	2 41 29.2	15.391	3	2 49 36.81	2.2470	14 18 11.6	13.102
4	1 7 25.95	2.1258	2 56 52.2	15.376	4	2 51 51.75	2.2510	14 31 15.2	13.020
5	1 9 33.53	2.1267	3 12 14.3	15.360	5	2 54 6.93	2.2551	14 44 13.9	12.936
6	1 11 41.16	2.1277	3 27 35.4	15.342	6	2 56 22.36	2.2592	14 57 7.5	12.851
7	1 13 48.86	2.1288	3 42 55.3	15.323	7	2 58 38.03	2.2633	15 9 56.0	12.765
8	1 15 56.62	2.1300	3 58 14.1	15.302	8	3 0 53.95	2.2675	15 22 39.3	12.677
9	1 18 4.46	2.1313	4 13 31.6	15.280	9	3 3 10.12	2.2717	15 35 17.2	12.588
10	1 20 12.37	2.1326	4 28 47.7	15.257	10	3 5 26.55	2.2759	15 47 49.8	12.497
11	1 22 20.37	2.1340	4 44 2.4	15.232	11	3 7 43.22	2.2802	16 0 16.9	12.405
12	1 24 28.45	2.1355	4 59 15.6	15.206	12	3 10 0.16	2.2845	16 12 38.4	12.312
13	1 26 36.62	2.1370	5 14 27.2	15.179	13	3 12 17.35	2.2888	16 24 54.3	12.217
14	1 28 44.89	2.1386	5 29 37.0	15.150	14	3 14 34.81	2.2931	16 37 4.4	12.121
15	1 30 53.26	2.1403	5 44 45.1	15.120	15	3 16 52.53	2.2975	16 49 8.7	12.023
16	1 33 1.73	2.1421	5 59 51.4	15.088	16	3 19 10.51	2.3019	17 1 7.2	11.924
17	1 35 10.32	2.1440	6 14 55.7	15.055	17	3 21 28.76	2.3063	17 12 59.6	11.824
18	1 37 19.01	2.1459	6 29 58.0	15.021	18	3 23 47.27	2.3108	17 24 46.0	11.722
19	1 39 27.82	2.1479	6 44 58.2	14.985	19	3 26 6.05	2.3152	17 36 26.2	11.619
20	1 41 36.76	2.1500	6 59 56.2	14.948	20	3 28 25.10	2.3197	17 48 0.2	11.514
21	1 43 45.83	2.1521	7 14 51.9	14.909	21	3 30 44.42	2.3242	17 59 27.9	11.408
22	1 45 55.02	2.1543	7 29 45.3	14.869	22	3 33 4.01	2.3287	18 10 49.2	11.301
23	1 48 4.35	2.1566	N. 7 44 36.2	14.828	23	3 35 23.87	2.3332	N. 18 22 4.0	11.192
TUESDAY 18.					THURSDAY 20.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	1 50 13.82	2.1590	N. 7 59 24.6	14.785	0	3 37 44.00	2.3377	N. 18 33 12.2	11.082
1	1 52 23.43	2.1614	8 14 10.4	14.741	1	3 40 4.40	2.3422	18 44 13.8	10.971
2	1 54 33.19	2.1639	8 28 53.5	14.695	2	3 42 25.07	2.3467	18 55 8.7	10.859
3	1 56 43.11	2.1665	8 43 33.8	14.648	3	3 44 46.01	2.3513	19 5 56.8	10.745
4	1 58 53.18	2.1691	8 58 11.3	14.600	4	3 47 7.22	2.3558	19 16 38.0	10.630
5	2 1 3.41	2.1718	9 12 45.9	14.550	5	3 49 28.71	2.3603	19 27 12.3	10.513
6	2 3 13.80	2.1746	9 27 17.4	14.499	6	3 51 50.46	2.3648	19 37 39.5	10.395
7	2 5 24.36	2.1775	9 41 45.8	14.447	7	3 54 12.48	2.3693	19 47 59.6	10.276
8	2 7 35.10	2.1804	9 56 11.0	14.393	8	3 56 34.77	2.3738	19 58 12.5	10.155
9	2 9 46.01	2.1834	10 10 33.0	14.338	9	3 58 57.33	2.3782	20 8 18.1	10.033
10	2 11 57.10	2.1864	10 24 51.6	14.281	10	4 1 20.16	2.3827	20 18 16.4	9.910
11	2 14 8.38	2.1895	10 39 6.7	14.223	11	4 3 43.25	2.3871	20 28 7.3	9.785
12	2 16 19.85	2.1927	10 53 18.3	14.163	12	4 6 6.61	2.3915	20 37 50.6	9.659
13	2 18 31.51	2.1959	11 7 26.3	14.102	13	4 8 30.23	2.3958	20 47 26.3	9.532
14	2 20 43.36	2.1992	11 21 30.6	14.040	14	4 10 54.12	2.4002	20 56 54.4	9.404
15	2 22 55.42	2.2025	11 35 31.1	13.976	15	4 13 18.26	2.4045	21 6 14.8	9.275
16	2 25 7.68	2.2059	11 49 27.7	13.911	16	4 15 42.66	2.4088	21 15 27.3	9.144
17	2 27 20.14	2.2094	12 3 20.4	13.845	17	4 18 7.32	2.4130	21 24 32.0	9.012
18	2 29 32.81	2.2129	12 17 9.1	13.777	18	4 20 32.23	2.4172	21 33 28.7	8.879
19	2 31 45.69	2.2165	12 30 53.7	13.708	19	4 22 57.39	2.4214	21 42 17.4	8.744
20	2 33 58.80	2.2201	12 44 34.0	13.637	20	4 25 22.80	2.4255	21 50 58.0	8.609
21	2 36 12.12	2.2238	12 58 10.1	13.565	21	4 27 48.46	2.4296	21 59 30.4	8.472
22	2 38 25.66	2.2275	13 11 41.8	13.491	22	4 30 14.36	2.4336	22 7 54.6	8.335
23	2 40 39.42	2.2313	13 25 9.0	13.416	23	4 32 40.50	2.4376	22 16 10.5	8.196
24	2 42 53.42	2.2352	N. 13 38 31.7	13.340	24	4 35 6.88	2.4415	N. 22 24 18.1	8.056

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 21.					SUNDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	4 35 6.88	2.4415	N.22 24 18.1	8.056	0	6 35 15.99	2.5234	N.25 54 5.1	0.488
1	4 37 33.49	2.4454	22 32 17.2	7.915	1	6 37 47.36	2.5222	25 54 29.5	0.324
2	4 40 0.34	2.4493	22 40 7.9	7.773	2	6 40 18.66	2.5209	25 54 44.0	+0.160
3	4 42 27.41	2.4530	22 47 50.0	7.630	3	6 42 49.87	2.5194	25 54 48.7	-0.004
4	4 44 54.71	2.4567	22 55 23.4	7.486	4	6 45 20.99	2.5178	25 54 43.5	0.168
5	4 47 22.23	2.4603	23 2 48.2	7.340	5	6 47 52.01	2.5161	25 54 28.5	0.331
6	4 49 49.96	2.4639	23 10 4.3	7.194	6	6 50 22.92	2.5142	25 54 3.8	0.494
7	4 52 17.90	2.4674	23 17 11.6	7.047	7	6 52 53.72	2.5122	25 53 29.3	0.656
8	4 54 46.05	2.4708	23 24 10.0	6.899	8	6 55 24.39	2.5101	25 52 45.1	0.818
9	4 57 14.41	2.4742	23 30 59.5	6.750	9	6 57 54.93	2.5079	25 51 51.1	0.980
10	4 59 42.97	2.4775	23 37 40.0	6.600	10	7 0 25.33	2.5055	25 50 47.5	1.141
11	5 2 11.71	2.4807	23 44 11.5	6.449	11	7 2 55.59	2.5030	25 49 34.2	1.302
12	5 4 40.64	2.4838	23 50 34.0	6.298	12	7 5 25.70	2.5004	25 48 11.3	1.462
13	5 7 9.76	2.4868	23 56 47.3	6.146	13	7 7 55.65	2.4977	25 46 38.8	1.621
14	5 9 39.05	2.4897	24 2 51.5	5.993	14	7 10 25.43	2.4949	25 44 56.8	1.780
15	5 12 8.52	2.4925	24 8 46.4	5.839	15	7 12 55.03	2.4919	25 43 5.3	1.938
16	5 14 38.16	2.4952	24 14 32.1	5.684	16	7 15 24.45	2.4888	25 41 4.3	2.095
17	5 17 7.96	2.4979	24 20 8.4	5.528	17	7 17 53.68	2.4856	25 38 53.8	2.252
18	5 19 37.91	2.5005	24 25 35.4	5.372	18	7 20 22.72	2.4823	25 36 34.0	2.408
19	5 22 8.01	2.5029	24 30 53.0	5.215	19	7 22 51.56	2.4789	25 34 4.8	2.564
20	5 24 38.26	2.5053	24 36 1.2	5.057	20	7 25 20.18	2.4753	25 31 26.3	2.719
21	5 27 8.65	2.5075	24 40 59.9	4.899	21	7 27 48.59	2.4716	25 28 38.5	2.873
22	5 29 39.17	2.5097	24 45 49.0	4.740	22	7 30 16.78	2.4679	25 25 41.5	3.026
23	5 32 9.82	2.5117	N.24 50 28.7	4.581	23	7 32 44.74	2.4640	N.25 22 35.3	3.179
SATURDAY 22.					MONDAY 24.				
0	5 34 40.58	2.5136	N.24 54 58.7	4.421	0	7 35 12.46	2.4600	N.25 19 20.0	3.331
1	5 37 11.46	2.5154	24 59 19.1	4.261	1	7 37 39.94	2.4559	25 15 55.6	3.482
2	5 39 42.44	2.5171	25 3 29.9	4.100	2	7 40 7.17	2.4517	25 12 22.2	3.632
3	5 42 13.51	2.5187	25 7 31.0	3.938	3	7 42 34.15	2.4474	25 8 39.9	3.780
4	5 44 44.68	2.5202	25 11 22.4	3.776	4	7 45 0.87	2.4430	25 4 48.6	3.928
5	5 47 15.94	2.5215	25 15 4.1	3.614	5	7 47 27.32	2.4386	25 0 48.5	4.075
6	5 49 47.27	2.5228	25 18 36.0	3.451	6	7 49 53.50	2.4340	24 56 39.6	4.221
7	5 52 18.67	2.5239	25 21 58.1	3.288	7	7 52 19.41	2.4294	24 52 22.0	4.366
8	5 54 50.14	2.5249	25 25 10.5	3.124	8	7 54 45.03	2.4247	24 47 55.7	4.510
9	5 57 21.66	2.5258	25 28 13.0	2.960	9	7 57 10.37	2.4199	24 43 20.8	4.653
10	5 59 53.23	2.5265	25 31 5.6	2.796	10	7 59 35.41	2.4150	24 38 37.3	4.795
11	6 2 24.84	2.5271	25 33 48.4	2.631	11	8 2 0.16	2.4100	24 33 45.4	4.936
12	6 4 56.48	2.5276	25 36 21.4	2.467	12	8 4 24.61	2.4049	24 28 45.1	5.076
13	6 7 28.15	2.5280	25 38 44.5	2.302	13	8 6 48.75	2.3997	24 23 36.4	5.214
14	6 9 59.83	2.5283	25 40 57.6	2.137	14	8 9 12.58	2.3945	24 18 19.4	5.352
15	6 12 31.53	2.5284	25 43 0.9	1.972	15	8 11 36.09	2.3892	24 12 54.2	5.488
16	6 15 3.23	2.5284	25 44 54.3	1.807	16	8 13 59.28	2.3838	24 7 20.8	5.623
17	6 17 34.93	2.5282	25 46 37.8	1.642	17	8 16 22.15	2.3784	24 1 39.4	5.757
18	6 20 6.61	2.5279	25 48 11.4	1.477	18	8 18 44.69	2.3729	23 55 50.0	5.890
19	6 22 38.27	2.5275	25 49 35.1	1.312	19	8 21 6.90	2.3673	23 49 52.6	6.022
20	6 25 9.90	2.5270	25 50 48.9	1.147	20	8 23 28.77	2.3617	23 43 47.3	6.153
21	6 27 41.50	2.5263	25 51 52.8	0.983	21	8 25 50.31	2.3560	23 37 34.3	6.282
22	6 30 13.05	2.5255	25 52 46.8	0.818	22	8 28 11.50	2.3503	23 31 13.5	6.410
23	6 32 44.55	2.5245	25 53 30.9	0.653	23	8 30 32.35	2.3445	23 24 45.1	6.536
24	6 35 15.99	2.5234	N.25 54 5.1	0.488	24	8 32 52.85	2.3387	N.23 18 9.1	6.662

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 25.					THURSDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 32 52.85	2.3387	N. 23 18 9.1	6.662	0	10 18 3.05	2.0455	N. 15 58 30.6	11.154
1	8 35 13.00	2.3329	23 11 25.6	6.786	1	10 20 5.61	2.0399	15 47 19.5	11.216
2	8 37 32.79	2.3270	23 4 34.7	6.909	2	10 22 7.83	2.0343	15 36 4.7	11.277
3	8 39 52.23	2.3210	22 57 36.5	7.031	3	10 24 9.72	2.0288	15 24 46.2	11.337
4	8 42 11.31	2.3150	22 50 31.0	7.151	4	10 26 11.28	2.0233	15 13 24.2	11.396
5	8 44 30.03	2.3090	22 43 18.3	7.271	5	10 28 12.51	2.0179	15 1 58.7	11.453
6	8 46 48.39	2.3029	22 35 58.5	7.389	6	10 30 13.42	2.0125	14 50 29.8	11.510
7	8 49 6.38	2.2968	22 28 31.6	7.506	7	10 32 14.00	2.0071	14 38 57.5	11.565
8	8 51 24.00	2.2907	22 20 57.8	7.621	8	10 34 14.27	2.0018	14 27 22.0	11.619
9	8 53 41.26	2.2845	22 13 17.1	7.735	9	10 36 14.22	1.9965	14 15 43.3	11.672
10	8 55 58.15	2.2783	22 5 29.6	7.848	10	10 38 13.86	1.9913	14 4 1.4	11.724
11	8 58 14.66	2.2721	21 57 35.4	7.959	11	10 40 13.19	1.9862	13 52 16.5	11.774
12	9 0 30.80	2.2659	21 49 34.6	8.069	12	10 42 12.21	1.9811	13 40 28.5	11.824
13	9 2 46.56	2.2596	21 41 27.2	8.178	13	10 44 10.93	1.9761	13 28 37.6	11.872
14	9 5 1.95	2.2534	21 33 13.4	8.285	14	10 46 9.35	1.9711	13 16 43.8	11.919
15	9 7 16.96	2.2471	21 24 53.1	8.391	15	10 48 7.47	1.9662	13 4 47.2	11.966
16	9 9 31.60	2.2408	21 16 26.5	8.495	16	10 50 5.30	1.9614	12 52 47.9	12.011
17	9 11 45.86	2.2345	21 7 53.7	8.598	17	10 52 2.84	1.9566	12 40 45.9	12.056
18	9 13 59.74	2.2282	20 59 14.7	8.700	18	10 54 0.09	1.9519	12 28 41.3	12.099
19	9 16 13.24	2.2219	20 50 29.6	8.801	19	10 55 57.06	1.9472	12 16 34.1	12.141
20	9 18 26.37	2.2156	20 41 38.5	8.901	20	10 57 53.75	1.9426	12 4 24.4	12.182
21	9 20 39.12	2.2093	20 32 41.5	8.999	21	10 59 50.17	1.9380	11 52 12.3	12.222
22	9 22 51.49	2.2030	20 23 38.6	9.096	22	11 1 46.31	1.9335	11 39 57.8	12.261
23	9 25 3.48	2.1967	N. 20 14 29.9	9.192	23	11 3 42.18	1.9290	N. 11 27 41.0	12.299
WEDNESDAY 26.					FRIDAY 28.				
0	9 27 15.10	2.1905	N. 20 5 15.6	9.286	0	11 5 37.79	1.9246	N. 11 15 21.9	12.336
1	9 29 26.34	2.1842	19 55 55.7	9.379	1	11 7 33.14	1.9203	11 3 0.7	12.372
2	9 31 37.20	2.1779	19 46 30.2	9.470	2	11 9 28.23	1.9160	10 50 37.3	12.407
3	9 33 47.68	2.1716	19 36 59.3	9.560	3	11 11 23.06	1.9118	10 38 11.8	12.441
4	9 35 57.79	2.1654	19 27 23.0	9.649	4	11 13 17.65	1.9077	10 25 44.3	12.474
5	9 38 7.52	2.1591	19 17 41.5	9.736	5	11 15 11.99	1.9036	10 13 14.9	12.506
6	9 40 16.88	2.1529	19 7 54.7	9.822	6	11 17 6.09	1.8996	10 0 43.6	12.537
7	9 42 25.87	2.1467	18 58 2.8	9.907	7	11 18 59.95	1.8956	9 48 10.4	12.567
8	9 44 34.48	2.1405	18 48 5.8	9.991	8	11 20 53.57	1.8917	9 35 35.4	12.596
9	9 46 42.72	2.1344	18 38 3.9	10.073	9	11 22 46.96	1.8879	9 22 58.8	12.625
10	9 48 50.60	2.1282	18 27 57.1	10.154	10	11 24 40.13	1.8842	9 10 20.5	12.652
11	9 50 58.11	2.1221	18 17 45.5	10.234	11	11 26 33.07	1.8805	8 57 40.5	12.679
12	9 53 5.25	2.1160	18 7 29.1	10.312	12	11 28 25.79	1.8769	8 44 59.0	12.705
13	9 55 12.03	2.1099	17 57 8.1	10.389	13	11 30 18.30	1.8733	8 32 16.0	12.730
14	9 57 18.44	2.1039	17 46 42.5	10.464	14	11 32 10.59	1.8698	8 19 31.5	12.754
15	9 59 24.49	2.0979	17 36 12.4	10.539	15	11 34 2.68	1.8664	8 6 45.6	12.777
16	10 1 30.18	2.0919	17 25 37.8	10.612	16	11 35 54.56	1.8631	7 53 58.3	12.799
17	10 3 35.52	2.0860	17 14 58.9	10.684	17	11 37 46.25	1.8598	7 41 9.7	12.820
18	10 5 40.50	2.0801	17 4 15.7	10.755	18	11 39 37.74	1.8566	7 28 19.9	12.840
19	10 7 45.13	2.0742	16 53 28.3	10.824	19	11 41 29.04	1.8534	7 15 28.9	12.860
20	10 9 49.40	2.0684	16 42 36.7	10.893	20	11 43 20.15	1.8503	7 2 36.7	12.879
21	10 11 53.33	2.0626	16 31 41.1	10.960	21	11 45 11.08	1.8473	6 49 43.5	12.897
22	10 13 56.91	2.0569	16 20 41.5	11.026	22	11 47 1.83	1.8444	6 36 49.2	12.914
23	10 16 0.15	2.0512	16 9 38.0	11.091	23	11 48 52.40	1.8415	6 23 53.9	12.930
24	10 18 3.05	2.0455	N. 15 58 30.6	11.154	24	11 50 42.81	1.8387	N. 6 10 57.6	12.945

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 29.					MONDAY 31.				
0	11 50 42.81	1.8387	N. 6 10 57.6	12.945	0	13 17 2.84	1.7854	S. 4 14 5.7	12.835
1	11 52 33.05	1.8360	5 58 0.5	12.960	1	13 18 49.98	1.7860	4 26 55.3	12.817
2	11 54 23.12	1.8333	5 45 2.5	12.974	2	13 20 37.17	1.7867	4 39 43.7	12.798
3	11 56 13.04	1.8307	5 32 3.8	12.987	3	13 22 24.39	1.7875	4 52 31.0	12.778
4	11 58 2.80	1.8282	5 19 4.3	12.999	4	13 24 11.66	1.7883	5 5 17.1	12.758
5	11 59 52.41	1.8257	5 6 4.0	13.010	5	13 25 58.98	1.7892	5 18 1.9	12.737
6	12 1 41.88	1.8233	4 53 3.1	13.021	6	13 27 46.36	1.7901	5 30 45.4	12.715
7	12 3 31.20	1.8210	4 40 1.6	13.031	7	13 29 33.79	1.7911	5 43 27.6	12.693
8	12 5 20.39	1.8187	4 26 59.4	13.040	8	13 31 21.29	1.7922	5 56 8.5	12.670
9	12 7 9.44	1.8165	4 13 56.8	13.048	9	13 33 8.86	1.7933	6 8 48.0	12.646
10	12 8 58.36	1.8143	4 0 53.7	13.056	10	13 34 56.50	1.7945	6 21 26.1	12.622
11	12 10 47.16	1.8122	3 47 50.1	13.063	11	13 36 44.21	1.7958	6 34 2.6	12.597
12	12 12 35.84	1.8102	3 34 46.1	13.069	12	13 38 32.00	1.7972	6 46 37.7	12.572
13	12 14 24.40	1.8083	3 21 41.8	13.075	13	13 40 19.88	1.7987	6 59 11.2	12.546
14	12 16 12.84	1.8065	3 8 37.2	13.079	14	13 42 7.84	1.8002	7 11 43.1	12.519
15	12 18 1.18	1.8047	2 55 32.3	13.083	15	13 43 55.90	1.8018	7 24 13.4	12.491
16	12 19 49.41	1.8030	2 42 27.2	13.086	16	13 45 44.05	1.8034	7 36 42.0	12.463
17	12 21 37.54	1.8014	2 29 21.9	13.088	17	13 47 32.30	1.8051	7 49 8.9	12.434
18	12 23 25.58	1.7998	2 16 16.5	13.090	18	13 49 20.66	1.8069	8 1 34.1	12.405
19	12 25 13.52	1.7983	2 3 11.0	13.091	19	13 51 9.12	1.8087	8 13 57.5	12.375
20	12 27 1.38	1.7969	1 50 5.4	13.092	20	13 52 57.70	1.8106	8 26 19.1	12.344
21	12 28 49.15	1.7956	1 36 59.8	13.092	21	13 54 46.40	1.8126	8 38 38.8	12.313
22	12 30 36.84	1.7943	1 23 54.3	13.091	22	13 56 35.21	1.8146	8 50 56.6	12.281
23	12 32 24.45	1.7931	N. 1 10 48.8	13.090	23	13 58 24.15	1.8167	S. 9 3 12.5	12.248
SUNDAY 30.					TUESDAY, FEBRUARY 1.				
0	12 34 12.00	1.7919	N. 0 57 43.4	13.088	0	14 0 13.22	1.8189	S. 9 15 26.4	12.215
1	12 35 59.48	1.7908	0 44 38.2	13.085	PHASES OF THE MOON.				
2	12 37 46.90	1.7898	0 31 33.2	13.081					
3	12 39 34.26	1.7889	0 18 28.5	13.077					
4	12 41 21.57	1.7880	N. 0 5 24.0	13.072					
5	12 43 8.83	1.7872	S. 0 7 40.1	13.066	<div> <div>☾ Last Quarter . . . . . Jan. 3 1 26.8</div> <div>● New Moon . . . . . 10 23 51.2</div> <div>☾ First Quarter . . . . . 17 22 20.6</div> <div>○ Full Moon . . . . . 24 23 50.6</div> </div>				
6	12 44 56.04	1.7865	0 20 43.9	13.060					
7	12 46 43.21	1.7859	0 33 47.3	13.053					
8	12 48 30.34	1.7853	0 46 50.2	13.045					
9	12 50 17.44	1.7848	0 59 52.6	13.037	<div> <div>☾ Apogee . . . . . Jan. 3 18.4</div> <div>☾ Perigee . . . . . 17 1.5</div> <div>☾ Apogee . . . . . 31 15.7</div> </div>				
10	12 52 4.51	1.7843	1 12 54.5	13.028					
11	12 53 51.56	1.7839	1 25 55.9	13.018					
12	12 55 38.58	1.7836	1 38 56.7	13.008					
13	12 57 25.59	1.7834	1 51 56.8	12.997					
14	12 59 12.59	1.7832	2 4 56.3	12.985					
15	13 0 59.58	1.7831	2 17 55.1	12.973					
16	13 2 46.57	1.7831	2 30 53.1	12.960					
17	13 4 33.56	1.7831	2 43 50.3	12.947					
18	13 6 20.55	1.7832	2 56 46.7	12.933					
19	13 8 7.55	1.7834	3 9 42.2	12.918					
20	13 9 54.57	1.7837	3 22 36.9	12.903					
21	13 11 41.60	1.7840	3 35 30.6	12.887					
22	13 13 28.65	1.7844	3 48 23.3	12.870					
23	13 15 15.73	1.7849	4 1 15.0	12.853					
24	13 17 2.84	1.7854	S. 4 14 5.7	12.835					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
1	Pollux W.	55 20 19	2974	56 51 4	2985	58 21 35	2994	59 51 54	3003
	Regulus W.	19 34 5	3090	21 2 27	3086	22 30 54	3082	23 59 26	3080
	Antares E.	81 21 37	2981	79 51 0	2990	78 20 34	2999	76 50 20	3009
	SUN E.	112 30 30	3354	111 7 21	3365	109 44 24	3374	108 21 38	3384
2	Pollux W.	67 21 3	3040	68 50 26	3046	70 19 42	3051	71 48 51	3056
	Regulus W.	31 22 13	3084	32 50 41	3087	34 19 6	3089	35 47 29	3091
	Antares E.	69 21 53	3048	67 52 40	3054	66 23 34	3060	64 54 36	3066
	SUN E.	101 30 24	3425	100 8 36	3432	98 46 56	3438	97 25 23	3444
3	Pollux W.	79 13 14	3075	80 41 54	3077	82 10 32	3078	83 39 8	3080
	Regulus W.	43 8 46	3100	44 36 56	3100	46 5 6	3101	47 33 15	3100
	Antares E.	57 31 16	3087	56 2 51	3090	54 34 29	3092	53 6 10	3094
	SUN E.	90 39 5	3465	89 18 2	3468	87 57 2	3470	86 36 4	3471
4	Pollux W.	91 1 55	3079	92 30 30	3077	93 59 8	3074	95 27 49	3072
	Regulus W.	54 54 12	3094	56 22 29	3092	57 50 49	3089	59 19 12	3086
	Antares E.	45 45 3	3098	44 16 51	3098	42 48 39	3097	41 20 26	3096
	SUN E.	79 51 27	3470	78 30 30	3468	77 9 31	3466	75 48 29	3463
5	Pollux W.	102 52 13	3052	104 21 22	3046	105 50 38	3040	107 20 1	3034
	Regulus W.	66 42 20	3062	68 11 16	3056	69 40 18	3050	71 9 28	3043
	JUPITER W.	21 40 27	3109	23 8 26	3100	24 36 36	3091	26 4 57	3081
	Antares E.	33 58 57	3088	32 30 33	3087	31 2 7	3085	29 33 39	3084
	SUN E.	69 2 22	3442	67 40 53	3436	66 19 17	3430	64 57 35	3423
6	Regulus W.	78 37 33	3005	80 7 40	2996	81 37 57	2987	83 8 26	2977
	JUPITER W.	33 29 40	3032	34 59 12	3022	36 28 57	3012	37 58 55	3001
	SUN E.	58 7 0	3384	56 44 25	3375	55 21 40	3366	53 58 44	3357
7	Regulus W.	90 43 56	2926	92 15 42	2915	93 47 41	2904	95 19 55	2892
	JUPITER W.	45 32 5	2946	47 3 26	2934	48 35 2	2922	50 6 53	2910
	SUN E.	47 1 12	3303	45 37 4	3292	44 12 43	3281	42 48 9	3269
8	Regulus W.	103 4 50	2833	104 38 36	2821	106 12 37	2808	107 46 54	2795
	JUPITER W.	57 50 2	2847	59 23 29	2834	60 57 12	2821	62 31 13	2808
	SUN E.	35 41 51	3210	34 15 53	3199	32 49 43	3188	31 23 19	3176
13	SUN W.	25 50 4	2752	27 25 35	2741	29 1 21	2731	30 37 20	2721
	SATURN E.	58 59 3	2394	57 15 20	2388	55 31 28	2382	53 47 27	2376
	MARS E.	66 54 19	2569	65 14 41	2562	63 34 54	2557	61 55 0	2551
	$\alpha$ Arietis E.	79 37 12	2487	77 55 40	2482	76 14 1	2477	74 32 16	2473
	Aldebaran E.	110 0 35	2402	108 17 3	2395	106 33 21	2388	104 49 29	2382
14	SUN W.	38 40 6	2684	40 17 7	2678	41 54 16	2673	43 31 32	2669
	SATURN E.	45 5 27	2352	43 20 43	2348	41 35 54	2344	39 50 59	2341
	MARS E.	53 33 41	2529	51 53 7	2526	50 12 29	2523	48 31 46	2520
	$\alpha$ Arietis E.	66 2 20	2462	64 20 13	2462	62 38 6	2462	60 55 59	2463
	Aldebaran E.	96 8 8	2356	94 23 30	2352	92 38 46	2348	90 53 57	2344
15	SUN W.	51 39 20	2649	53 17 9	2646	54 55 1	2643	56 32 57	2641
	SATURN E.	31 5 22	2329	29 20 5	2327	27 34 45	2326	25 49 24	2325



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
1	Pollux W.	61 22 3	3011	62 52 2	3019	64 21 51	3026	65 51 31	3033
	Regulus W.	25 28 1	3079	26 56 36	3080	28 25 10	3081	29 53 42	3082
	Antares E.	75 20 18	3018	73 50 27	3026	72 20 46	3034	70 51 15	3041
	SUN E.	106 59 3	3393	105 36 39	3402	104 14 25	3410	102 52 20	3418
2	Pollux W.	73 17 54	3061	74 46 51	3065	76 15 43	3069	77 44 31	3072
	Regulus W.	37 15 49	3093	38 44 7	3095	40 12 22	3097	41 40 35	3099
	Antares E.	63 25 45	3071	61 56 59	3076	60 28 20	3080	58 59 46	3083
	SUN E.	96 3 57	3450	94 42 37	3454	93 21 22	3458	92 0 12	3462
3	Pollux W.	85 7 42	3081	86 36 15	3081	88 4 48	3081	89 33 21	3080
	Regulus W.	49 1 25	3100	50 29 35	3099	51 57 45	3098	53 25 57	3096
	Antares E.	51 37 54	3096	50 9 40	3097	48 41 27	3098	47 13 15	3098
	SUN E.	85 15 8	3472	83 54 13	3472	82 33 18	3472	81 12 23	3471
4	Pollux W.	96 56 33	3068	98 25 21	3065	99 54 13	3061	101 23 10	3056
	Regulus W.	60 47 39	3082	62 16 11	3078	63 44 48	3073	65 13 31	3068
	Antares E.	39 52 12	3095	38 23 56	3093	36 55 38	3092	35 27 19	3090
	SUN E.	74 27 24	3460	73 6 16	3456	71 45 3	3452	70 23 45	3447
5	Pollux W.	108 49 31	3027	110 19 10	3020	111 48 57	3013	113 18 54	3005
	Regulus W.	72 38 47	3036	74 8 14	3029	75 37 51	3022	77 7 37	3014
	JUPITER W.	27 33 30	3071	29 2 15	3062	30 31 11	3052	32 0 19	3042
	Antares E.	28 5 9	3083	26 36 39	3082	25 8 8	3082	23 39 37	3082
	SUN E.	63 35 45	3416	62 13 47	3408	60 51 41	3400	59 29 25	3392
6	Regulus W.	84 39 7	2968	86 10 0	2958	87 41 5	2947	89 12 24	2937
	JUPITER W.	39 29 6	2991	40 59 30	2980	42 30 8	2969	44 0 59	2958
	SUN E.	52 35 38	3347	51 12 20	3336	49 48 50	3325	48 25 7	3314
7	Regulus W.	96 52 24	2880	98 25 8	2868	99 58 6	2857	101 31 20	2845
	JUPITER W.	51 38 59	2898	53 11 21	2886	54 43 58	2873	56 16 52	2860
	SUN E.	41 23 21	3257	39 58 19	3246	38 33 4	3234	37 7 35	3221
8	Regulus W.	109 21 28	2783	110 56 18	2771	112 31 24	2758	114 6 47	2746
	JUPITER W.	64 5 30	2795	65 40 5	2782	67 14 56	2769	68 50 5	2755
	SUN E.	29 56 41	3165	28 29 50	3155	27 2 47	3145	25 35 32	3135
13	SUN W.	32 13 32	2712	33 49 55	2704	35 26 29	2697	37 3 13	2690
	SATURN E.	52 3 17	2371	50 19 0	2366	48 34 36	2361	46 50 5	2356
	MARS E.	60 14 58	2545	58 34 48	2541	56 54 32	2537	55 14 9	2533
	α Arietis E.	72 50 25	2470	71 8 29	2467	69 26 29	2465	67 44 26	2463
	Aldebaran E.	103 5 29	2377	101 21 21	2371	99 37 4	2366	97 52 40	2361
14	SUN W.	45 8 54	2664	47 46 22	2660	48 23 56	2656	50 1 36	2652
	SATURN E.	38 6 0	2338	36 20 56	2335	34 35 48	2333	32 50 37	2331
	MARS E.	46 51 0	2517	45 10 10	2515	43 29 18	2513	41 48 23	2512
	α Arietis E.	59 13 54	2465	57 31 51	2468	55 49 51	2471	54 7 57	2475
	Aldebaran E.	89 9 2	2341	87 24 3	2338	85 38 59	2335	83 53 51	2333
15	SUN W.	58 10 57	2639	59 48 59	2638	61 27 3	2636	63 5 10	2635
	SATURN E.	24 4 1	2324	22 18 37	2325	20 33 14	2326	18 47 52	2328

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
15	MARS E.	40 7 27	2512	38 26 30	2511	36 45 32	2512	35 4 35	2513
	α Arietis E.	52 26 9	2481	50 44 29	2487	49 2 58	2495	47 21 38	2504
	Aldebaran E.	82 8 39	2331	80 23 24	2329	78 38 6	2327	76 52 46	2325
16	SUN W.	64 43 18	2633	66 21 28	2632	67 59 39	2631	69 37 52	2631
	Aldebaran E.	68 5 39	2322	66 20 12	2322	64 34 44	2322	62 49 17	2322
	Pollux E.	112 11 43	2303	110 25 48	2303	108 39 53	2302	106 53 57	2302
17	SUN W.	77 48 58	2631	79 27 11	2632	81 5 23	2632	82 43 35	2633
	Aldebaran E.	54 2 19	2329	52 17 2	2331	50 31 48	2334	48 46 37	2337
	Pollux E.	98 4 10	2302	96 18 13	2302	94 32 17	2303	92 46 22	2303
18	SUN W.	90 54 14	2639	92 32 16	2640	94 10 17	2641	95 48 16	2643
	α Pegasi W.	42 8 17	2397	43 32 32	2335	44 58 0	2380	46 24 33	2312
	SATURN W.	11 17 4	2348	13 1 54	2344	14 46 49	2341	16 31 49	2339
	Aldebaran E.	40 1 55	2356	38 17 17	2362	36 32 48	2369	34 48 29	2377
	Pollux E.	83 57 2	2309	82 11 15	2310	80 25 30	2311	78 39 47	2313
	Regulus E.	120 6 41	2321	118 21 12	2322	116 35 45	2323	114 50 19	2324
19	SUN W.	103 57 27	2655	105 35 8	2657	107 12 45	2660	108 50 19	2663
	α Pegasi W.	53 50 4	2957	55 21 10	2932	56 52 48	2910	58 24 54	2891
	SATURN W.	25 17 10	2340	27 2 11	2342	28 47 10	2344	30 32 6	2345
	Pollux E.	69 51 53	2323	68 6 27	2326	66 21 5	2328	64 35 46	2331
	Regulus E.	106 3 36	2332	104 18 22	2334	102 33 12	2335	100 48 4	2337
20	SUN W.	116 57 5	2680	118 34 12	2684	120 11 13	2688	121 48 8	2692
	α Pegasi W.	66 10 43	2823	67 44 41	2814	69 18 51	2807	70 53 11	2801
	SATURN W.	39 16 1	2358	41 0 37	2361	42 45 7	2364	44 29 33	2367
	MARS W.	28 3 0	2562	29 42 47	2561	31 22 35	2561	33 2 23	2562
	Pollux E.	55 50 14	2346	54 5 22	2350	52 20 35	2353	50 35 53	2357
	Regulus E.	92 3 19	2351	90 18 34	2354	88 33 54	2357	86 49 18	2361
21	α Pegasi W.	78 46 20	2786	80 21 6	2786	81 55 52	2787	83 30 37	2789
	SATURN W.	53 10 26	2387	54 54 19	2392	56 38 5	2397	58 21 44	2402
	MARS W.	41 20 58	2572	43 0 31	2575	44 40 0	2579	46 19 24	2583
	α Arietis W.	35 11 34	2682	36 48 38	2663	38 26 9	2646	40 4 2	2632
	Pollux E.	41 53 58	2381	40 9 56	2387	38 26 2	2393	36 42 17	2399
	Regulus E.	78 7 44	2382	76 23 44	2387	74 39 51	2392	72 56 4	2397
	JUPITER E.	123 58 11	2382	122 14 10	2386	120 30 15	2390	118 46 26	2395
22	α Pegasi W.	91 23 18	2812	92 57 30	2820	94 31 32	2828	96 5 23	2837
	SATURN W.	66 58 12	2429	68 41 5	2435	70 23 50	2441	72 6 26	2448
	MARS W.	54 34 51	2608	56 13 35	2614	57 52 12	2620	59 30 40	2626
	α Arietis W.	48 17 10	2593	49 56 14	2590	51 35 22	2588	53 14 33	2588
	Pollux E.	28 5 58	2438	26 23 17	2448	24 40 50	2458	22 58 38	2470
	Regulus E.	64 19 9	2426	62 36 12	2433	60 53 24	2440	59 10 46	2447
	JUPITER E.	110 9 8	2421	108 26 3	2427	106 43 7	2433	105 0 19	2439
23	α Pegasi W.	103 51 20	2897	105 23 43	2912	106 55 47	2928	108 27 30	2945
	SATURN W.	80 36 57	2485	82 18 32	2493	83 59 55	2501	85 41 7	2510
	MARS W.	67 40 42	2663	69 18 13	2671	70 55 32	2679	72 32 41	2687
	α Arietis W.	61 30 19	2597	63 9 18	2601	64 48 12	2605	66 27 0	2610

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
15	MARS	E.	33 23 39	2515	31 42 45	2517	30 1 55	2520	28 21 9	2524
	α Arietis	E.	45 40 31	2515	43 59 39	2528	42 19 5	2543	40 38 52	2560
	Aldebaran	E.	75 7 23	2324	73 21 59	2323	71 36 33	2322	69 51 6	2322
16	SUN	W.	71 16 5	2631	72 54 18	2631	74 32 31	2631	76 10 44	2630
	Aldebaran	E.	61 3 50	2323	59 18 25	2324	57 33 1	2326	55 47 39	2327
	Pollux	E.	105 8 0	2302	103 22 3	2302	101 36 5	2302	99 50 8	2302
17	SUN	W.	84 21 46	2634	85 59 55	2635	87 38 3	2636	89 16 9	2637
	Aldebaran	E.	47 1 31	2340	45 16 29	2343	43 31 32	2347	41 46 40	2351
	Pollux	E.	91 0 27	2304	89 14 34	2305	87 28 42	2306	85 42 51	2307
18	SUN	W.	97 26 12	2645	99 4 5	2647	100 41 55	2649	102 19 43	2652
	α Pegasi	W.	47 52 4	3089	49 20 27	3050	50 49 38	3015	52 19 32	2985
	SATURN	W.	18 16 53	2338	20 1 58	2337	21 47 3	2338	23 32 7	2339
	Aldebaran	E.	33 4 20	2386	31 20 24	2396	29 36 42	2407	27 53 15	2418
	Pollux	E.	76 54 7	2315	75 8 29	2317	73 22 54	2319	71 37 22	2321
	Regulus	E.	113 4 54	2325	111 19 32	2326	109 34 11	2328	107 48 52	2330
19	SUN	W.	110 27 49	2666	112 5 15	2669	113 42 36	2672	115 19 53	2676
	α Pegasi	W.	59 57 24	2874	61 30 17	2859	63 3 29	2845	64 36 58	2833
	SATURN	W.	32 17 0	2347	34 1 51	2350	35 46 38	2353	37 31 21	2355
	Pollux	E.	62 50 31	2333	61 5 20	2336	59 20 13	2339	57 35 11	2343
	Regulus	E.	99 2 59	2340	97 17 58	2343	95 33 1	2346	93 48 8	2348
20	SUN	W.	123 24 58	2697	125 1 42	2702	126 38 18	2707	128 14 48	2712
	α Pegasi	W.	72 27 38	2796	74 2 12	2792	75 36 51	2789	77 11 34	2787
	SATURN	W.	46 13 55	2371	47 58 11	2375	49 42 22	2379	51 26 27	2383
	MARS	W.	34 42 10	2563	36 21 56	2564	38 1 40	2566	39 41 21	2569
	Pollux	E.	48 51 17	2362	47 6 47	2366	45 22 24	2371	43 38 7	2376
	Regulus	E.	85 4 48	2365	83 20 23	2369	81 36 4	2373	79 51 51	2378
21	α Pegasi	W.	85 5 19	2792	86 39 57	2796	88 14 30	2800	89 48 58	2806
	SATURN	W.	60 5 17	2407	61 48 42	2412	63 32 0	2417	65 15 10	2423
	MARS	W.	47 58 42	2588	49 37 54	2592	51 17 0	2597	52 55 59	2602
	α Arietis	W.	41 42 13	2621	43 20 40	2611	44 59 21	2603	46 38 12	2597
	Pollux	E.	34 58 41	2405	33 15 14	2412	31 31 57	2420	29 48 52	2429
	Regulus	E.	71 12 25	2402	69 28 53	2408	67 45 30	2414	66 2 15	2420
	JUPITER	E.	117 2 44	2400	115 19 9	2405	113 35 41	2410	111 52 21	2415
22	α Pegasi	W.	97 39 3	2847	99 12 30	2859	100 45 42	2871	102 18 39	2883
	SATURN	W.	73 48 52	2455	75 31 8	2462	77 13 15	2470	78 55 11	2477
	MARS	W.	61 8 59	2633	62 47 9	2640	64 25 10	2647	66 3 1	2655
	α Arietis	W.	54 53 45	2588	56 32 57	2589	58 12 8	2591	59 51 16	2594
	Pollux	E.	21 16 43	2484	19 35 7	2501	17 53 55	2521	16 13 10	2543
	Regulus	E.	57 28 18	2455	55 46 1	2463	54 3 55	2471	52 22 1	2479
	JUPITER	E.	103 17 40	2446	101 35 11	2453	99 52 51	2460	98 10 41	2467
23	α Pegasi	W.	109 58 52	2964	111 29 50	2984	113 0 23	3005	114 30 30	3025
	SATURN	W.	87 22 7	2518	89 2 55	2527	90 43 31	2536	92 23 54	2545
	MARS	W.	74 9 39	2696	75 46 25	2705	77 22 58	2714	78 59 19	2723
	α Arietis	W.	68 5 42	2616	69 44 16	2622	71 22 41	2628	73 0 57	2635

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
23	Aldebaran W.	30 28 57	2543	32 9 11	2545	33 49 22	2547	35 29 30	2550
	Regulus E.	50 40 18	2488	48 58 47	2497	47 17 30	2507	45 36 26	2517
	JUPITER E.	96 28 41	2475	94 46 52	2482	93 5 14	2490	91 23 47	2498
	Spica E.	104 43 22	2483	103 1 49	2493	101 20 26	2501	99 39 14	2509
24	SATURN W.	94 4 5	2555	95 44 2	2564	97 23 46	2574	99 3 16	2584
	MARS W.	80 35 28	2733	82 11 24	2743	83 47 6	2753	85 22 35	2764
	α Arietis W.	74 39 4	2643	76 17 0	2651	77 54 45	2660	79 32 19	2669
	Aldebaran W.	43 48 46	2577	45 28 13	2584	47 7 30	2591	48 46 37	2599
	Regulus E.	37 14 43	2573	35 35 11	2586	33 55 56	2599	32 17 0	2613
	JUPITER E.	82 59 30	2543	81 19 16	2553	79 39 16	2562	77 59 29	2572
	Spica E.	91 16 11	2553	89 36 12	2563	87 56 26	2573	86 16 54	2583
25	SATURN W.	107 17 16	2637	108 55 21	2649	110 33 10	2660	112 10 44	2671
	MARS W.	93 16 31	2818	94 50 35	2830	96 24 23	2842	97 57 57	2854
	α Arietis W.	87 37 3	2718	89 13 19	2729	90 49 21	2740	92 25 8	2751
	Aldebaran W.	56 59 17	2645	58 37 11	2655	60 14 51	2665	61 52 18	2675
	JUPITER E.	69 44 0	2624	68 5 38	2635	66 27 30	2646	64 49 38	2657
26	MARS W.	105 41 54	2915	107 13 54	2927	108 45 39	2939	110 17 8	2952
	α Arietis W.	100 20 12	2812	101 54 24	2825	103 28 19	2838	105 1 58	2852
	Aldebaran W.	69 55 59	2730	71 31 59	2741	73 7 45	2752	74 43 16	2764
	Pollux W.	25 45 27	2735	27 21 20	2744	28 57 1	2753	30 32 30	2763
	JUPITER E.	56 44 5	2715	55 7 45	2727	53 31 41	2738	51 55 52	2750
	Antares E.	110 57 51	2719	109 21 37	2731	107 45 38	2742	106 9 54	2754
27	Aldebaran W.	82 37 2	2821	84 11 2	2833	85 44 48	2845	87 18 18	2856
	Pollux W.	38 26 41	2815	40 0 50	2825	41 34 45	2835	43 8 27	2846
	JUPITER E.	44 0 45	2810	42 26 31	2822	40 52 32	2835	39 18 49	2847
	Antares E.	98 15 3	2812	96 40 51	2823	95 6 53	2835	93 33 10	2846
28	Aldebaran W.	95 2 11	2912	96 34 15	2922	98 6 6	2933	99 37 43	2943
	Pollux W.	50 53 30	2899	52 25 50	2909	53 57 57	2919	55 29 51	2929
	Regulus W.	15 13 18	3084	16 41 47	3060	18 10 46	3044	19 40 5	3034
	JUPITER E.	31 34 4	2906	30 1 53	2918	28 29 57	2930	26 58 17	2942
	Antares E.	85 48 14	2901	84 15 57	2912	82 43 54	2923	81 12 4	2933
29	Aldebaran W.	107 12 36	2993	108 42 58	3002	110 13 8	3011	111 43 7	3020
	Pollux W.	63 6 19	2976	64 37 2	2984	66 7 35	2992	67 37 57	3000
	Regulus W.	27 7 56	3033	28 37 28	3036	30 6 57	3039	31 36 21	3043
	Antares E.	73 36 4	2981	72 5 28	2990	70 35 4	2999	69 4 50	3007
	SUN E.	133 7 56	3373	131 45 9	3382	130 22 32	3390	129 0 4	3399
30	Pollux W.	75 7 28	3035	76 36 57	3041	78 6 18	3046	79 35 33	3051
	Regulus W.	39 2 12	3063	40 31 7	3067	41 59 57	3071	43 28 42	3074
	Antares E.	61 36 9	3045	60 6 52	3051	58 37 42	3057	57 8 40	3063
	SUN E.	122 9 57	3434	120 48 19	3440	119 26 48	3446	118 5 23	3451
31	Pollux W.	87 0 25	3071	88 29 10	3073	89 57 52	3076	91 26 31	3078
	Regulus W.	50 51 29	3087	52 19 54	3089	53 48 16	3091	55 16 37	3092
	Antares E.	49 45 6	3086	48 16 39	3090	46 48 17	3093	45 19 58	3096
	SUN E.	111 19 39	3471	109 58 43	3473	108 37 49	3475	107 16 58	3477

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
23	Aldebaran W.	37 9 34	2554	38 49 33	2556	40 29 25	2564	42 9 10	2570
	Regulus E.	43 55 35	2527	42 14 59	2538	40 34 38	2549	38 54 32	2561
	JUPITER E.	89 42 31	2507	88 1 27	2516	86 20 36	2525	84 39 57	2534
	Spica E.	97 58 14	2517	96 17 25	2526	94 36 48	2535	92 56 23	2544
24	SATURN W.	100 42 33	2595	102 21 35	2605	104 0 23	2615	105 38 57	2626
	MARS W.	86 57 50	2775	88 32 51	2785	90 7 39	2796	91 42 12	2807
	α Arietis W.	81 9 42	2678	82 46 52	2687	84 23 49	2697	86 0 33	2707
	Aldebaran W.	50 25 33	2608	52 4 17	2617	53 42 50	2626	55 21 10	2635
	Regulus E.	30 38 23	2629	29 0 8	2646	27 22 15	2664	25 44 46	2683
	JUPITER E.	76 19 55	2582	74 40 35	2592	73 1 29	2602	71 22 37	2613
	Spica E.	84 37 35	2593	82 58 30	2604	81 19 40	2614	79 41 4	2624
25	SATURN W.	113 48 3	2683	115 25 6	2694	117 1 54	2705	118 38 26	2716
	MARS W.	99 31 15	2866	101 4 18	2878	102 37 5	2890	104 9 37	2902
	α Arietis W.	94 0 41	2763	95 35 58	2775	97 10 59	2787	98 45 44	2800
	Aldebaran W.	63 29 31	2686	65 6 30	2697	66 43 14	2708	68 19 44	2719
	JUPITER E.	63 12 1	2669	61 34 39	2680	59 57 32	2692	58 20 41	2703
26	MARS W.	111 48 22	2965	113 19 19	2977	114 50 1	2989	116 20 27	3002
	α Arietis W.	106 35 19	2865	108 8 23	2879	109 41 9	2893	111 13 37	2907
	Aldebaran W.	76 18 31	2775	77 53 31	2787	79 28 16	2798	81 2 46	2809
	Pollux W.	32 7 47	2773	33 42 51	2783	35 17 41	2793	36 52 18	2804
	JUPITER E.	50 20 19	2763	48 45 2	2775	47 10 1	2786	45 35 15	2798
	Antares E.	104 34 26	2765	102 59 12	2777	101 24 14	2788	99 49 31	2800
27	Aldebaran W.	88 51 34	2867	90 24 35	2879	91 57 21	2890	93 29 53	2901
	Pollux W.	44 41 55	2857	46 15 9	2868	47 48 9	2878	49 20 56	2888
	JUPITER E.	37 45 21	2859	36 12 9	2870	34 39 12	2882	33 6 30	2894
	Antares E.	91 59 42	2858	90 26 29	2869	88 53 30	2880	87 20 45	2891
28	Aldebaran W.	101 9 7	2954	102 40 18	2964	104 11 16	2973	105 42 2	2983
	Pollux W.	57 1 33	2939	58 33 2	2949	60 4 19	2958	61 35 25	2967
	Regulus W.	21 9 35	3030	22 39 10	3030	24 8 46	3030	25 38 22	3031
	JUPITER E.	25 26 52	2955	23 55 43	2968	22 24 50	2981	20 54 13	2993
	Antares E.	79 40 27	2943	78 9 3	2953	76 37 51	2963	75 6 52	2972
29	Aldebaran W.	113 12 55	3028	114 42 33	3036	116 12 1	3043	117 41 20	3051
	Pollux W.	69 8 10	3008	70 38 13	3015	72 8 6	3022	73 37 51	3029
	Regulus W.	33 5 41	3047	34 34 56	3051	36 4 6	3055	37 33 12	3059
	Antares E.	67 34 46	3015	66 4 53	3023	64 35 9	3031	63 5 35	3038
	SUN E.	127 37 46	3407	126 15 37	3414	124 53 36	3421	123 31 43	3427
30	Pollux W.	81 4 42	3056	82 33 45	3060	84 2 43	3064	85 31 36	3068
	Regulus W.	44 57 23	3078	46 25 59	3081	47 54 32	3083	49 23 2	3085
	Antares E.	55 39 45	3068	54 10 56	3073	52 42 14	3078	51 13 37	3082
	SUN E.	116 44 4	3456	115 22 50	3461	114 1 42	3465	112 40 39	3468
31	Pollux W.	92 55 8	3079	94 23 44	3080	95 52 18	3079	97 20 53	3079
	Regulus W.	56 44 56	3093	58 13 14	3092	59 41 33	3091	61 9 53	3091
	Antares E.	43 51 43	3098	42 23 31	3100	40 55 22	3102	39 27 15	3104
	SUN E.	105 56 8	3479	104 35 20	3480	103 14 33	3480	101 53 46	3479

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time. to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ' "	"	' "	s	m s	s
Tues.	1	20 56 58.01	10.208	S. 17 15 52.8	+ 42.28	16 15.65	68.31	13 40.84	0.351
Wed.	2	21 1 2.61	10.175	16 58 49.5	43.02	16 15.50	68.19	13 48.87	0.317
Thur.	3	21 5 6.40	10.141	16 41 28.3	43.75	16 15.34	68.07	13 56.09	0.284
Frid.	4	21 9 9.39	10.107	16 23 49.6	+ 44.47	16 15.18	67.96	14 2.51	0.250
Sat.	5	21 13 11.58	10.074	16 5 53.8	45.18	16 15.01	67.84	14 8.13	0.217
SUN.	6	21 17 12.97	10.041	15 47 41.3	45.87	16 14.85	67.73	14 12.95	0.184
Mon.	7	21 21 13.57	10.008	15 29 12.4	+ 46.54	16 14.68	67.61	14 16.97	0.151
Tues.	8	21 25 13.37	9.974	15 10 27.6	47.19	16 14.51	67.50	14 20.20	0.118
Wed.	9	21 29 12.36	9.941	14 51 27.5	47.82	16 14.33	67.38	14 22.64	0.085
Thur.	10	21 33 10.57	9.909	14 32 12.4	+ 48.44	16 14.15	67.27	14 24.29	0.052
Frid.	11	21 37 8.00	9.876	14 12 42.8	49.04	16 13.97	67.16	14 25.15	0.019
Sat.	12	21 41 4.64	9.843	13 52 59.0	49.62	16 13.79	67.06	14 25.22	0.013
SUN.	13	21 45 0.49	9.812	13 33 1.4	+ 50.18	16 13.60	66.95	14 24.52	0.045
Mon.	14	21 48 55.57	9.779	13 12 50.6	50.72	16 13.41	66.84	14 23.06	0.077
Tues.	15	21 52 49.89	9.747	12 52 27.1	51.24	16 13.22	66.74	14 20.84	0.109
Wed.	16	21 56 43.46	9.716	12 31 51.3	+ 51.75	16 13.03	66.64	14 17.86	0.140
Thur.	17	22 0 36.28	9.685	12 11 3.5	52.24	16 12.83	66.54	14 14.13	0.170
Frid.	18	22 4 28.37	9.655	11 50 4.1	52.71	16 12.63	66.44	14 9.67	0.200
Sat.	19	22 8 19.73	9.626	11 28 53.6	+ 53.16	16 12.42	66.34	14 4.51	0.229
SUN.	20	22 12 10.40	9.597	11 7 32.4	53.60	16 12.22	66.24	13 58.65	0.258
Mon.	21	22 16 0.40	9.569	10 46 0.9	54.02	16 12.01	66.14	13 52.11	0.286
Tues.	22	22 19 49.74	9.542	10 24 19.6	+ 54.42	16 11.79	66.04	13 44.91	0.313
Wed.	23	22 23 38.43	9.516	10 2 28.8	54.81	16 11.57	65.95	13 37.07	0.339
Thur.	24	22 27 26.49	9.490	9 40 28.9	55.18	16 11.34	65.86	13 28.61	0.365
Frid.	25	22 31 13.95	9.465	9 18 20.3	+ 55.54	16 11.11	65.77	13 19.53	0.390
Sat.	26	22 35 0.83	9.441	8 56 3.3	55.88	16 10.88	65.69	13 9.88	0.414
SUN.	27	22 38 47.14	9.418	8 33 38.3	56.20	16 10.64	65.61	12 59.67	0.437
Mon.	28	22 42 32.90	9.395	8 11 5.7	56.51	16 10.40	65.54	12 48.91	0.460
Tues.	29	22 46 18.14	9.373	S. 7 48 26.0	+ 56.80	16 10.16	65.46	12 37.60	0.481

**NOTE.**—The mean time of semidiameter passing the meridian may be found by subtracting 0<sup>s</sup>.18 from the sidereal time. The sign + prehed to the hourly change of declination indicates that south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Tues.	1	20 56 55.68	10.207	S. 17 16 2.5	+ 42.25	13 40.75	0.351	20 43 14.93
Wed.	2	21 1 0.26	10.174	16 58 59.5	43.00	13 48.78	0.317	20 47 11.48
Thur.	3	21 5 4.04	10.141	16 41 38.5	43.74	13 56.00	0.284	20 51 8.04
Frid.	4	21 9 7.02	10.108	16 24 0.0	+ 44.46	14 2.43	0.250	20 55 4.60
Sat.	5	21 13 9.20	10.074	16 6 4.5	45.17	14 8.05	0.217	20 59 1.15
SUN.	6	21 17 10.59	10.041	15 47 52.2	45.86	14 12.88	0.184	21 2 57.71
Mon.	7	21 21 11.18	10.008	15 29 23.5	+ 46.53	14 16.92	0.151	21 6 54.26
Tues.	8	21 25 10.97	9.975	15 10 38.9	47.18	14 20.16	0.118	21 10 50.82
Wed.	9	21 29 9.97	9.942	14 51 39.0	47.81	14 22.60	0.085	21 14 47.37
Thur.	10	21 33 8.19	9.909	14 32 24.1	+ 48.43	14 24.26	0.052	21 18 43.93
Frid.	11	21 37 5.62	9.877	14 12 54.6	49.03	14 25.13	0.019	21 22 40.49
Sat.	12	21 41 2.27	9.844	13 53 10.9	49.61	14 25.22	0.013	21 26 37.04
SUN.	13	21 44 58.13	9.812	13 33 13.5	+ 50.17	14 24.53	0.045	21 30 33.60
Mon.	14	21 48 53.22	9.780	13 13 2.8	50.71	14 23.07	0.077	21 34 30.15
Tues.	15	21 52 47.55	9.748	12 52 39.4	51.23	14 20.85	0.109	21 38 26.71
Wed.	16	21 56 41.13	9.717	12 32 3.7	+ 51.74	14 17.88	0.140	21 42 23.26
Thur.	17	22 0 33.97	9.686	12 11 15.9	52.23	14 14.16	0.170	21 46 19.82
Frid.	18	22 4 26.08	9.656	11 50 16.5	52.71	14 9.71	0.200	21 50 16.37
Sat.	19	22 8 17.47	9.627	11 29 6.0	+ 53.16	14 4.55	0.229	21 54 12.93
SUN.	20	22 12 8.17	9.598	11 7 44.9	53.60	13 58.69	0.258	21 58 9.48
Mon.	21	22 15 58.19	9.570	10 46 13.5	54.02	13 52.15	0.286	22 2 6.03
Tues.	22	22 19 47.55	9.543	10 24 32.1	+ 54.42	13 44.96	0.313	22 6 2.59
Wed.	23	22 23 36.26	9.517	10 2 41.3	54.81	13 37.12	0.339	22 9 59.14
Thur.	24	22 27 24.35	9.492	9 40 41.4	55.18	13 28.66	0.365	22 13 55.70
Frid.	25	22 31 11.84	9.467	9 18 32.7	+ 55.54	13 19.59	0.390	22 17 52.25
Sat.	26	22 34 58.75	9.443	8 56 15.6	55.88	13 9.94	0.414	22 21 48.81
SUN.	27	22 38 45.09	9.420	8 33 50.5	56.20	12 59.73	0.437	22 25 45.36
Mon.	28	22 42 30.89	9.397	8 11 17.8	56.51	12 48.98	0.460	22 29 41.91
Tues.	29	22 46 16.16	9.375	S. 7 48 38.0	+ 56.80	12 37.69	0.481	22 33 38.47

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour,  
+9°.8565.  
(Table III.)

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.	
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
1	32	311 46 28.4	46 38.1	152.20	— 0.06	9.993 6565	+ 27.8	h m s 3 16 12.84	
2	33	312 47 20.7	47 30.2	152.16	0.16	9.993 7243	28.6	3 12 16.93	
3	34	313 48 12.1	48 21.5	152.13	0.28	9.993 7941	29.4	3 8 21.02	
4	35	314 49 2.7	49 12.0	152.09	— 0.40	9.993 8656	+ 30.1	3 4 25.11	
5	36	315 49 52.4	50 1.5	152.05	0.53	9.993 9388	30.8	3 0 29.20	
6	37	316 50 41.1	50 50.1	152.01	0.64	9.994 0135	31.4	2 56 33.29	
7	38	317 51 28.8	51 37.6	151.96	— 0.74	9.994 0895	+ 32.0	2 52 37.38	
8	39	318 52 15.3	52 24.0	151.91	0.82	9.994 1668	32.5	2 48 41.47	
9	40	319 53 0.7	53 9.2	151.86	0.88	9.994 2453	33.0	2 44 45.56	
10	41	320 53 44.8	53 53.1	151.81	— 0.90	9.994 3249	+ 33.4	2 40 49.65	
11	42	321 54 27.5	54 35.7	151.75	0.90	9.994 4055	33.9	2 36 53.74	
12	43	322 55 8.7	55 16.8	151.68	0.87	9.994 4872	34.3	2 32 57.83	
13	44	323 55 48.3	55 56.3	151.62	— 0.80	9.994 5700	+ 34.7	2 29 1.92	
14	45	324 56 26.3	56 34.1	151.55	0.71	9.994 6539	35.2	2 25 6.01	
15	46	325 57 2.5	57 10.2	151.47	0.60	9.994 7391	35.7	2 21 10.10	
16	47	326 57 36.9	57 44.5	151.39	— 0.47	9.994 8256	+ 36.3	2 17 14.19	
17	48	327 58 9.5	58 17.0	151.32	0.34	9.994 9136	37.0	2 13 18.28	
18	49	328 58 40.3	58 47.7	151.24	0.20	9.995 0033	37.7	2 9 22.38	
19	50	329 59 9.2	59 16.5	151.17	— 0.07	9.995 0947	+ 38.4	2 5 26.47	
20	51	330 59 36.3	59 43.4	151.09	+ 0.03	9.995 1878	39.2	2 1 30.56	
21	52	332 0 1.6	0 8.6	151.02	0.11	9.995 2828	40.0	1 57 34.65	
22	53	333 0 25.1	0 32.0	150.94	+ 0.17	9.995 3798	+ 40.8	1 53 38.74	
23	54	334 0 46.9	0 53.6	150.87	0.20	9.995 4787	41.6	1 49 42.83	
24	55	335 1 6.9	1 13.5	150.80	0.21	9.995 5794	42.4	1 45 46.92	
25	56	336 1 25.3	1 31.8	150.73	+ 0.19	9.995 6819	+ 43.1	1 41 51.02	
26	57	337 1 42.1	1 48.4	150.66	0.14	9.995 7863	43.8	1 37 55.11	
27	58	338 1 57.2	2 3.5	150.59	+ 0.07	9.995 8924	44.5	1 33 59.20	
28	59	339 2 10.7	2 16.9	150.53	— 0.02	9.996 0001	45.2	1 30 3.29	
29	60	340 2 22.7	2 28.7	150.47	— 0.13	9.996 1093	+ 45.8	1 26 7.38	

NOTE.—The numbers in column  $\lambda$  correspond to the true equinox of the date; in column  $\lambda'$  to the mean equinox of January 0.0.

Diff. for 1 Hour,  
— 9<sup>h</sup>.8296.  
(Table II.)



GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
							<sup>h</sup> <sup>m</sup>	<sup>m</sup>	<sup>d</sup>
1	14 48.1	14 48.9	54 13.2	+ 0.15	54 16.3	+ 0.37	17 46.8	1.76	21.0
2	14 50.4	14 52.7	54 22.1	0.59	54 30.5	0.81	18 30.1	1.86	22.0
3	14 55.7	14 59.4	54 41.5	1.02	54 54.9	1.22	19 16.4	2.00	23.0
4	15 3.7	15 8.6	55 10.7	+ 1.40	55 28.6	+ 1.57	20 6.3	2.15	24.0
5	15 14.0	15 19.8	55 48.4	1.71	56 9.8	1.84	20 59.7	2.29	25.0
6	15 25.9	15 32.3	56 32.4	1.93	56 55.8	1.98	21 56.0	2.39	26.0
7	15 38.8	15 45.3	57 19.6	+ 1.99	57 43.4	+ 1.96	22 53.7	2.41	27.0
8	15 51.6	15 57.6	58 6.4	1.89	58 28.5	1.78	23 50.9	2.35	28.0
9	16 3.2	16 8.2	58 48.9	1.63	59 7.3	1.44	. . .	. .	29.0
10	16 12.5	16 16.1	59 23.2	+ 1.22	59 36.4	+ 0.98	0 46.4	2.27	0.4
11	16 18.9	16 20.8	59 46.7	0.72	59 53.8	+ 0.46	1 39.7	2.17	1.4
12	16 21.9	16 22.2	59 57.8	+ 0.21	59 58.8	- 0.04	2 31.0	2.11	2.4
13	16 21.7	16 20.4	59 56.9	- 0.27	59 52.4	- 0.47	3 21.2	2.09	3.4
14	16 18.6	16 16.2	59 45.6	0.65	59 36.8	0.81	4 11.3	2.11	4.4
15	16 13.3	16 10.1	59 26.3	0.93	59 14.4	1.03	5 2.5	2.16	5.4
16	16 6.6	16 2.9	59 1.6	- 1.11	58 47.9	- 1.16	5 55.5	2.26	6.4
17	15 59.0	15 55.0	58 33.6	1.20	58 19.1	1.22	6 50.8	2.34	7.4
18	15 51.0	15 47.0	58 4.3	1.23	57 49.5	1.24	7 48.0	2.41	8.4
19	15 42.9	15 38.8	57 34.6	- 1.24	57 19.7	- 1.24	8 45.8	2.40	9.4
20	15 34.8	15 30.8	57 4.9	1.23	56 50.2	1.22	9 42.6	2.32	10.4
21	15 26.8	15 22.9	56 35.6	1.21	56 21.1	1.20	10 36.8	2.19	11.4
22	15 19.0	15 15.1	56 6.8	- 1.18	55 52.7	- 1.16	11 27.6	2.04	12.4
23	15 11.4	15 7.7	55 39.0	1.13	55 25.6	1.09	12 14.9	1.90	13.4
24	15 4.2	15 0.9	55 12.8	1.04	55 0.6	0.98	12 59.1	1.79	14.4
25	14 57.8	14 55.0	54 49.2	- 0.91	54 38.8	- 0.82	13 40.9	1.71	15.4
26	14 52.5	14 50.3	54 29.6	0.72	54 21.6	0.60	14 21.4	1.67	16.4
27	14 48.6	14 47.3	54 15.2	0.46	54 10.5	- 0.32	15 1.5	1.67	17.4
28	14 46.5	14 46.3	54 7.6	- 0.15	54 6.8	+ 0.02	15 42.2	1.72	18.4
29	14 46.6	14 47.6	54 8.2	+ 0.21	54 11.8	+ 0.41	16 24.4	1.80	19.4

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 1.					THURSDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	14 0 13.22	1.8189	S. 9 15 26.4	12.215	0	15 31 15.08	1.9968	S. 18 9 54.7	9.756
1	14 2 2.42	1.8212	9 27 38.3	12.182	1	15 33 15.04	2.0019	18 19 37.9	9.684
2	14 3 51.76	1.8235	9 39 48.2	12.148	2	15 35 15.31	2.0070	18 29 16.8	9.612
3	14 5 41.24	1.8258	9 51 56.0	12.112	3	15 37 15.88	2.0121	18 38 51.4	9.539
4	14 7 30.86	1.8283	10 4 1.6	12.076	4	15 39 16.76	2.0173	18 48 21.5	9.465
5	14 9 20.63	1.8308	10 16 5.1	12.039	5	15 41 17.96	2.0226	18 57 47.2	9.390
6	14 11 10.56	1.8334	10 28 6.3	12.002	6	15 43 19.47	2.0278	19 7 8.3	9.313
7	14 13 0.64	1.8360	10 40 5.3	11.964	7	15 45 21.30	2.0331	19 16 24.8	9.236
8	14 14 50.88	1.8388	10 52 2.0	11.925	8	15 47 23.44	2.0384	19 25 36.6	9.158
9	14 16 41.29	1.8415	11 3 56.3	11.886	9	15 49 25.91	2.0438	19 34 43.7	9.079
10	14 18 31.86	1.8443	11 15 48.3	11.846	10	15 51 28.70	2.0493	19 43 46.1	8.999
11	14 20 22.61	1.8473	11 27 37.8	11.804	11	15 53 31.82	2.0547	19 52 43.6	8.918
12	14 22 13.53	1.8502	11 39 24.8	11.763	12	15 55 35.26	2.0601	20 1 36.2	8.836
13	14 24 4.63	1.8533	11 51 9.4	11.722	13	15 57 39.03	2.0656	20 10 23.9	8.753
14	14 25 55.92	1.8563	12 2 51.4	11.678	14	15 59 43.13	2.0712	20 19 6.5	8.668
15	14 27 47.39	1.8595	12 14 30.8	11.635	15	16 1 47.57	2.0768	20 27 44.1	8.584
16	14 29 39.06	1.8628	12 26 7.6	11.590	16	16 3 52.34	2.0823	20 36 16.6	8.498
17	14 31 30.92	1.8660	12 37 41.6	11.545	17	16 5 57.45	2.0880	20 44 43.9	8.411
18	14 33 22.98	1.8693	12 49 13.0	11.500	18	16 8 2.90	2.0936	20 53 5.9	8.323
19	14 35 15.24	1.8728	13 0 41.6	11.453	19	16 10 8.68	2.0993	21 1 22.6	8.233
20	14 37 7.71	1.8763	13 12 7.4	11.406	20	16 12 14.81	2.1050	21 9 33.9	8.143
21	14 39 0.39	1.8798	13 23 30.3	11.358	21	16 14 21.28	2.1107	21 17 39.8	8.052
22	14 40 53.29	1.8834	13 34 50.3	11.308	22	16 16 28.09	2.1163	21 25 40.2	7.960
23	14 42 46.40	1.8870	S. 13 46 7.3	11.258	23	16 18 35.24	2.1221	S. 21 33 35.0	7.867
WEDNESDAY 2.					FRIDAY 4.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	14 44 39.73	1.8908	S. 13 57 21.3	11.208	0	16 20 42.74	2.1279	S. 21 41 24.2	7.773
1	14 46 33.29	1.8945	14 8 32.3	11.158	1	16 22 50.59	2.1337	21 49 7.7	7.678
2	14 48 27.07	1.8983	14 19 40.2	11.106	2	16 24 58.78	2.1394	21 56 45.5	7.581
3	14 50 21.09	1.9023	14 30 45.0	11.053	3	16 27 7.32	2.1453	22 4 17.4	7.483
4	14 52 15.35	1.9063	14 41 46.6	11.000	4	16 29 16.21	2.1511	22 11 43.4	7.384
5	14 54 9.84	1.9103	14 52 45.0	10.946	5	16 31 25.45	2.1569	22 19 3.5	7.285
6	14 56 4.58	1.9143	15 3 40.1	10.891	6	16 33 35.04	2.1628	22 26 17.6	7.184
7	14 57 59.56	1.9184	15 14 31.9	10.835	7	16 35 44.98	2.1686	22 33 25.6	7.083
8	14 59 54.79	1.9226	15 25 20.3	10.778	8	16 37 55.27	2.1744	22 40 27.5	6.980
9	15 1 50.27	1.9268	15 36 5.3	10.721	9	16 40 5.91	2.1802	22 47 23.2	6.876
10	15 3 46.01	1.9312	15 46 46.8	10.663	10	16 42 16.89	2.1860	22 54 12.6	6.770
11	15 5 42.01	1.9355	15 57 24.8	10.603	11	16 44 28.23	2.1919	23 0 55.6	6.664
12	15 7 38.27	1.9399	16 7 59.2	10.543	12	16 46 39.92	2.1978	23 7 32.3	6.558
13	15 9 34.80	1.9444	16 18 30.0	10.483	13	16 48 51.96	2.2036	23 14 2.5	6.449
14	15 11 31.60	1.9489	16 28 57.1	10.421	14	16 51 4.35	2.2093	23 20 26.2	6.339
15	15 13 28.67	1.9535	16 39 20.5	10.358	15	16 53 17.08	2.2151	23 26 43.2	6.228
16	15 15 26.02	1.9581	16 49 40.1	10.295	16	16 55 30.16	2.2209	23 32 53.6	6.117
17	15 17 23.64	1.9628	16 59 55.9	10.231	17	16 57 43.59	2.2268	23 38 57.3	6.005
18	15 19 21.55	1.9675	17 10 7.8	10.166	18	16 59 57.37	2.2325	23 44 54.2	5.892
19	15 21 19.74	1.9723	17 20 15.8	10.100	19	17 2 11.49	2.2382	23 50 44.3	5.777
20	15 23 18.22	1.9771	17 30 19.8	10.033	20	17 4 25.95	2.2439	23 56 27.4	5.661
21	15 25 16.99	1.9820	17 40 19.7	9.964	21	17 6 40.76	2.2497	24 2 3.6	5.544
22	15 27 16.06	1.9869	17 50 15.5	9.896	22	17 8 55.91	2.2553	24 7 32.8	5.427
23	15 29 15.42	1.9918	18 0 7.2	9.827	23	17 11 11.40	2.2610	24 12 54.8	5.308
24	15 31 15.08	1.9968	S. 18 9 54.7	9.756	24	17 13 27.23	2.2666	S. 24 18 9.6	5.187

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 5.					MONDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	17 13 27.23	2.2666	S. 24 18 9.6	5.187	0	19 7 40.60	2.4625	S. 25 50 30.3	1.647
1	17 15 43.39	2.2722	24 23 17.2	5.066	1	19 10 8.41	2.4643	25 48 46.8	1.805
2	17 17 59.89	2.2778	24 28 17.5	4.944	2	19 12 36.32	2.4660	25 46 53.7	1.964
3	17 20 16.72	2.2833	24 33 10.5	4.821	3	19 15 4.33	2.4676	25 44 51.1	2.123
4	17 22 33.88	2.2888	24 37 56.0	4.696	4	19 17 32.43	2.4691	25 42 39.0	2.282
5	17 24 51.37	2.2942	24 42 34.0	4.571	5	19 20 0.62	2.4705	25 40 17.3	2.442
6	17 27 9.18	2.2995	24 47 4.5	4.444	6	19 22 28.89	2.4717	25 37 46.0	2.601
7	17 29 27.31	2.3049	24 51 27.3	4.317	7	19 24 57.23	2.4728	25 35 5.2	2.760
8	17 31 45.77	2.3102	24 55 42.5	4.188	8	19 27 25.63	2.4739	25 32 14.8	2.919
9	17 34 4.54	2.3154	24 59 49.9	4.058	9	19 29 54.10	2.4749	25 29 14.9	3.079
10	17 36 23.62	2.3207	25 3 49.5	3.928	10	19 32 22.62	2.4757	25 26 5.3	3.239
11	17 38 43.02	2.3259	25 7 41.3	3.798	11	19 34 51.18	2.4763	25 22 46.2	3.399
12	17 41 2.73	2.3310	25 11 25.2	3.665	12	19 37 19.78	2.4769	25 19 17.4	3.559
13	17 43 22.74	2.3361	25 15 1.1	3.532	13	19 39 48.41	2.4774	25 15 39.1	3.719
14	17 45 43.06	2.3411	25 18 29.0	3.398	14	19 42 17.07	2.4778	25 11 51.1	3.879
15	17 48 3.67	2.3459	25 21 48.8	3.262	15	19 44 45.75	2.4781	25 7 53.6	4.038
16	17 50 24.57	2.3508	25 25 0.4	3.125	16	19 47 14.44	2.4782	25 3 46.5	4.198
17	17 52 45.77	2.3557	25 28 3.8	2.988	17	19 49 43.13	2.4782	24 59 29.9	4.357
18	17 55 7.25	2.3603	25 30 58.9	2.849	18	19 52 11.82	2.4782	24 55 3.7	4.517
19	17 57 29.01	2.3650	25 33 45.7	2.711	19	19 54 40.51	2.4780	24 50 27.9	4.676
20	17 59 51.05	2.3697	25 36 24.2	2.571	20	19 57 9.18	2.4776	24 45 42.6	4.835
21	18 2 13.37	2.3742	25 38 54.2	2.429	21	19 59 37.82	2.4772	24 40 47.7	4.993
22	18 4 35.95	2.3786	25 41 15.7	2.288	22	20 2 6.44	2.4768	24 35 43.4	5.152
23	18 6 58.80	2.3830	S. 25 43 28.7	2.145	23	20 4 35.03	2.4762	S. 24 30 29.5	5.310
SUNDAY 6.					TUESDAY 8.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	18 9 21.91	2.3873	S. 25 45 33.1	2.002	0	20 7 3.58	2.4754	S. 24 25 6.2	5.468
1	18 11 45.28	2.3915	25 47 28.9	1.858	1	20 9 32.08	2.4746	24 19 33.4	5.625
2	18 14 8.89	2.3956	25 49 16.1	1.713	2	20 12 0.53	2.4737	24 13 51.2	5.783
3	18 16 32.75	2.3997	25 50 54.5	1.567	3	20 14 28.92	2.4726	24 7 59.5	5.939
4	18 18 56.85	2.4037	25 52 24.1	1.420	4	20 16 57.24	2.4714	24 1 58.5	6.095
5	18 21 21.19	2.4075	25 53 44.9	1.273	5	20 19 25.49	2.4703	23 55 48.1	6.251
6	18 23 45.75	2.4113	25 54 56.8	1.124	6	20 21 53.67	2.4690	23 49 28.4	6.406
7	18 26 10.54	2.4150	25 55 59.8	0.976	7	20 24 21.77	2.4676	23 42 59.4	6.561
8	18 28 35.55	2.4186	25 56 53.9	0.826	8	20 26 49.78	2.4660	23 36 21.1	6.715
9	18 31 0.77	2.4221	25 57 38.9	0.675	9	20 29 17.69	2.4644	23 29 33.6	6.868
10	18 33 26.20	2.4255	25 58 14.9	0.525	10	20 31 45.51	2.4628	23 22 36.9	7.021
11	18 35 51.83	2.4288	25 58 41.9	0.373	11	20 34 13.23	2.4610	23 15 31.1	7.173
12	18 38 17.65	2.4320	25 58 59.7	0.221	12	20 36 40.83	2.4591	23 8 16.2	7.324
13	18 40 43.67	2.4352	25 59 8.4	-0.068	13	20 39 8.32	2.4572	23 0 52.2	7.475
14	18 43 9.87	2.4382	25 59 7.9	+0.086	14	20 41 35.69	2.4551	22 53 19.2	7.625
15	18 45 36.25	2.4411	25 58 58.1	0.240	15	20 44 2.93	2.4530	22 45 37.2	7.774
16	18 48 2.80	2.4438	25 58 39.1	0.394	16	20 46 30.05	2.4508	22 37 46.3	7.923
17	18 50 29.51	2.4465	25 58 10.8	0.549	17	20 48 57.03	2.4485	22 29 46.5	8.071
18	18 52 56.38	2.4492	25 57 33.2	0.705	18	20 51 23.87	2.4462	22 21 37.8	8.218
19	18 55 23.41	2.4517	25 56 46.2	0.861	19	20 53 50.57	2.4438	22 13 20.3	8.364
20	18 57 50.58	2.4540	25 55 49.9	1.017	20	20 56 17.13	2.4413	22 4 54.1	8.508
21	19 0 17.89	2.4563	25 54 44.2	1.174	21	20 58 43.54	2.4388	21 56 19.3	8.653
22	19 2 45.34	2.4585	25 53 29.0	1.332	22	21 1 9.79	2.4362	21 47 35.8	8.796
23	19 5 12.91	2.4605	25 52 4.4	1.489	23	21 3 35.87	2.4334	21 38 43.8	8.938
24	19 7 40.60	2.4625	S. 25 50 30.3	1.647	24	21 6 1.79	2.4307	S. 21 29 43.2	9.080

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 9.					FRIDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 6 1.79	2.4307	S. 21 29 43.2	9.080	0	22 58 52.60	2.2683	S. 11 54 28.0	14.343
1	21 8 27.55	2.4278	21 20 34.2	9.220	1	23 1 8.60	2.2651	11 40 5.2	14.417
2	21 10 53.13	2.4249	21 11 16.8	9.359	2	23 3 24.41	2.2619	11 25 38.0	14.488
3	21 13 18.54	2.4221	21 1 51.1	9.497	3	23 5 40.03	2.2588	11 11 6.6	14.558
4	21 15 43.78	2.4191	20 52 17.2	9.634	4	23 7 55.47	2.2558	10 56 31.1	14.625
5	21 18 8.83	2.4160	20 42 35.0	9.771	5	23 10 10.73	2.2528	10 41 51.6	14.691
6	21 20 33.70	2.4130	20 32 44.7	9.906	6	23 12 25.81	2.2498	10 27 8.2	14.756
7	21 22 58.39	2.4099	20 22 46.3	10.039	7	23 14 40.71	2.2469	10 12 20.9	14.818
8	21 25 22.89	2.4067	20 12 40.0	10.172	8	23 16 55.44	2.2439	9 57 30.0	14.879
9	21 27 47.19	2.4034	20 2 25.7	10.303	9	23 19 9.98	2.2410	9 42 35.4	14.939
10	21 30 11.30	2.4002	19 52 3.6	10.433	10	23 21 24.36	2.2383	9 27 37.3	14.997
11	21 32 35.21	2.3969	19 41 33.7	10.563	11	23 23 38.58	2.2357	9 12 35.8	15.053
12	21 34 58.93	2.3936	19 30 56.1	10.691	12	23 25 52.64	2.2330	8 57 31.0	15.107
13	21 37 22.44	2.3902	19 20 10.8	10.817	13	23 28 6.54	2.2303	8 42 23.0	15.159
14	21 39 45.75	2.3868	19 9 18.0	10.943	14	23 30 20.28	2.2277	8 27 11.9	15.211
15	21 42 8.86	2.3834	18 58 17.7	11.066	15	23 32 33.86	2.2252	8 11 57.7	15.261
16	21 44 31.76	2.3799	18 47 10.1	11.188	16	23 34 47.30	2.2228	7 56 40.6	15.308
17	21 46 54.45	2.3765	18 35 55.1	11.310	17	23 37 0.59	2.2203	7 41 20.7	15.354
18	21 49 16.94	2.3730	18 24 32.9	11.430	18	23 39 13.74	2.2179	7 25 58.1	15.398
19	21 51 39.21	2.3694	18 13 3.5	11.549	19	23 41 26.74	2.2156	7 10 32.9	15.441
20	21 54 1.27	2.3659	18 1 27.0	11.666	20	23 43 39.61	2.2133	6 55 5.2	15.482
21	21 56 23.12	2.3624	17 49 43.5	11.782	21	23 45 52.34	2.2112	6 39 35.1	15.522
22	21 58 44.76	2.3588	17 37 53.2	11.898	22	23 48 4.95	2.2091	6 24 2.6	15.560
23	22 1 6.18	2.3553	S. 17 25 56.0	12.010	23	23 50 17.43	2.2070	S. 6 8 27.9	15.596
THURSDAY 10.					SATURDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	22 3 27.39	2.3517	S. 17 13 52.0	12.121	0	23 52 29.79	2.2050	S. 5 52 51.1	15.630
1	22 5 48.38	2.3481	17 1 41.4	12.232	1	23 54 42.03	2.2031	5 37 12.3	15.662
2	22 8 9.16	2.3445	16 49 24.2	12.340	2	23 56 54.16	2.2012	5 21 31.6	15.693
3	22 10 29.72	2.3409	16 37 0.6	12.448	3	23 59 6.17	2.1993	5 5 49.1	15.723
4	22 12 50.07	2.3373	16 24 30.5	12.554	4	0 1 18.08	2.1976	4 50 4.9	15.751
5	22 15 10.20	2.3338	16 11 54.1	12.658	5	0 3 29.88	2.1958	4 34 19.0	15.777
6	22 17 30.12	2.3302	15 59 11.6	12.760	6	0 5 41.58	2.1942	4 18 31.7	15.801
7	22 19 49.82	2.3266	15 46 22.9	12.862	7	0 7 53.19	2.1928	4 2 42.9	15.823
8	22 22 9.31	2.3230	15 33 28.1	12.963	8	0 10 4.71	2.1913	3 46 52.9	15.844
9	22 24 28.58	2.3194	15 20 27.4	13.066	9	0 12 16.14	2.1898	3 31 1.6	15.864
10	22 26 47.64	2.3158	15 7 20.9	13.157	10	0 14 27.48	2.1884	3 15 9.2	15.882
11	22 29 6.48	2.3123	14 54 8.6	13.253	11	0 16 38.75	2.1872	2 59 15.7	15.898
12	22 31 25.11	2.3088	14 40 50.6	13.346	12	0 18 49.94	2.1859	2 43 21.4	15.912
13	22 33 43.53	2.3053	14 27 27.1	13.438	13	0 21 1.06	2.1848	2 27 26.3	15.925
14	22 36 1.74	2.3018	14 13 58.1	13.528	14	0 23 12.12	2.1838	2 11 30.4	15.937
15	22 38 19.74	2.2983	14 0 23.7	13.617	15	0 25 23.11	2.1827	1 55 33.9	15.946
16	22 40 37.53	2.2948	13 46 44.0	13.704	16	0 27 34.04	2.1818	1 39 36.9	15.953
17	22 42 55.12	2.2914	13 32 59.2	13.789	17	0 29 44.92	2.1809	1 23 39.5	15.960
18	22 45 12.50	2.2880	13 19 9.3	13.874	18	0 31 55.75	2.1802	1 7 41.7	15.965
19	22 47 29.68	2.2847	13 5 14.3	13.957	19	0 34 6.54	2.1794	0 51 43.7	15.968
20	22 49 46.66	2.2813	12 51 14.5	14.038	20	0 36 17.28	2.1787	0 35 45.6	15.968
21	22 52 3.44	2.2780	12 37 9.8	14.118	21	0 38 27.98	2.1782	0 19 47.5	15.968
22	22 54 20.02	2.2748	12 23 0.4	14.195	22	0 40 38.66	2.1777	S. 0 3 49.4	15.967
23	22 56 36.41	2.2715	12 8 46.4	14.270	23	0 42 49.30	2.1772	N. 0 12 8.6	15.964
24	22 58 52.60	2.2683	S. 11 54 28.0	14.343	24	0 44 59.92	2.1768	N. 0 28 6.3	15.958

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 13.					TUESDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	44 59.92	2.1768	N. 0 28 6.3	15.958	0	2 30 23.96	2.2403	N. 12 38 46.8	13.909
1	47 10.52	2.1766	0 44 3.6	15.952	1	2 32 38.46	2.2431	12 52 39.0	13.830
2	49 21.11	2.1763	1 0 0.5	15.944	2	2 34 53.13	2.2460	13 6 26.4	13.750
3	51 31.68	2.1762	1 15 56.9	15.934	3	2 37 7.98	2.2489	13 20 9.0	13.669
4	53 42.25	2.1761	1 31 52.6	15.923	4	2 39 23.00	2.2519	13 33 46.7	13.587
5	55 52.81	2.1760	1 47 47.6	15.909	5	2 41 38.21	2.2549	13 47 19.4	13.503
6	58 3.37	2.1761	2 3 41.7	15.895	6	2 43 53.59	2.2579	14 0 47.0	13.417
7	1 0 13.94	2.1762	2 19 35.0	15.879	7	2 46 9.16	2.2610	14 14 9.4	13.329
8	2 24.52	2.1764	2 35 27.2	15.862	8	2 48 24.91	2.2641	14 27 26.5	13.241
9	4 35.11	2.1767	2 51 18.4	15.843	9	2 50 40.85	2.2673	14 40 38.3	13.152
10	6 45.73	2.1771	3 7 8.3	15.821	10	2 52 56.98	2.2704	14 53 44.7	13.061
11	8 56.36	2.1774	3 22 56.9	15.798	11	2 55 13.30	2.2737	15 6 45.6	12.969
12	11 7.02	2.1780	3 38 44.1	15.774	12	2 57 29.82	2.2770	15 19 41.0	12.876
13	13 17.72	2.1786	3 54 29.8	15.748	13	2 59 46.54	2.2803	15 32 30.7	12.780
14	15 28.45	2.1792	4 10 13.9	15.722	14	3 2 3.45	2.2836	15 45 14.6	12.684
15	17 39.22	2.1799	4 25 56.4	15.693	15	3 4 20.57	2.2870	15 57 52.8	12.587
16	19 50.04	2.1807	4 41 37.1	15.663	16	3 6 37.89	2.2904	16 10 25.0	12.488
17	22 0.90	2.1815	4 57 15.9	15.631	17	3 8 55.42	2.2938	16 22 51.3	12.388
18	24 11.82	2.1825	5 12 52.8	15.598	18	3 11 13.15	2.2973	16 35 11.5	12.286
19	26 22.80	2.1835	5 28 27.7	15.563	19	3 13 31.09	2.3008	16 47 25.6	12.183
20	28 33.84	2.1845	5 44 0.4	15.527	20	3 15 49.24	2.3043	16 59 33.4	12.078
21	30 44.94	2.1856	5 59 30.9	15.488	21	3 18 7.60	2.3078	17 11 35.0	11.974
22	32 56.11	2.1868	6 14 59.0	15.449	22	3 20 26.17	2.3113	17 23 30.3	11.868
23	35 7.35	2.1881	N. 6 30 24.8	15.409	23	3 22 44.95	2.3148	N. 17 35 19.1	11.759
MONDAY 14.					WEDNESDAY 16.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	1 37 18.68	2.1895	N. 6 45 48.1	15.367	0	3 25 3.94	2.3183	N. 17 47 1.4	11.650
1	39 30.09	2.1908	7 1 8.8	15.323	1	3 27 23.15	2.3219	17 58 37.1	11.540
2	41 41.58	2.1923	7 16 26.8	15.277	2	3 29 42.57	2.3255	18 10 6.2	11.428
3	43 53.16	2.1938	7 31 42.0	15.230	3	3 32 2.21	2.3291	18 21 28.5	11.315
4	46 4.84	2.1955	7 46 54.4	15.182	4	3 34 22.06	2.3327	18 32 44.0	11.201
5	48 16.62	2.1972	8 2 3.8	15.132	5	3 36 42.13	2.3363	18 43 52.6	11.086
6	50 28.50	2.1988	8 17 10.2	15.081	6	3 39 2.42	2.3399	18 54 54.3	10.970
7	52 40.48	2.2006	8 32 13.5	15.028	7	3 41 22.92	2.3435	19 5 49.0	10.853
8	54 52.57	2.2025	8 47 13.6	14.973	8	3 43 43.64	2.3471	19 16 36.6	10.733
9	57 4.78	2.2044	9 2 10.3	14.918	9	3 46 4.57	2.3507	19 27 17.0	10.613
10	59 17.10	2.2064	9 17 3.7	14.861	10	3 48 25.72	2.3543	19 37 50.2	10.493
11	2 1 29.55	2.2085	9 31 53.6	14.803	11	3 50 47.09	2.3580	19 48 16.1	10.370
12	2 3 42.12	2.2106	9 46 40.0	14.743	12	3 53 8.68	2.3616	19 58 34.6	10.247
13	2 5 54.82	2.2128	10 1 22.7	14.681	13	3 55 30.48	2.3651	20 8 45.7	10.123
14	2 8 7.65	2.2150	10 16 1.7	14.618	14	3 57 52.49	2.3687	20 18 49.3	9.997
15	2 10 20.62	2.2173	10 30 36.8	14.553	15	4 0 14.72	2.3722	20 28 45.3	9.870
16	2 12 33.72	2.2196	10 45 8.0	14.488	16	4 2 37.15	2.3757	20 38 33.7	9.742
17	2 14 46.97	2.2220	10 59 35.2	14.420	17	4 4 59.80	2.3793	20 48 14.4	9.613
18	2 17 0.36	2.2244	11 13 58.4	14.351	18	4 7 22.66	2.3828	20 57 47.3	9.483
19	2 19 13.90	2.2270	11 28 17.4	14.281	19	4 9 45.73	2.3862	21 7 12.4	9.353
20	2 21 27.60	2.2296	11 42 32.1	14.209	20	4 12 9.00	2.3896	21 16 29.6	9.221
21	2 23 41.45	2.2322	11 56 42.5	14.137	21	4 14 32.48	2.3930	21 25 38.9	9.088
22	2 25 55.46	2.2348	12 10 48.5	14.062	22	4 16 56.16	2.3963	21 34 40.1	8.953
23	2 28 9.63	2.2375	12 24 49.9	13.986	23	4 19 20.04	2.3997	21 43 33.3	8.819
24	2 30 23.96	2.2403	N. 12 38 46.8	13.909	24	4 21 44.12	2.4030	N. 21 52 18.4	8.683

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 17.					SATURDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	4 21 44.12	2.4030	N. 21 52 18.4	8.683	1	6 19 44.19	2.4817	N. 25 58 8.1	1.370
2	4 24 8.40	2.4063	22 0 55.3	8.546	2	6 22 13.07	2.4809	25 59 25.5	1.209
3	4 26 32.88	2.4096	22 9 23.9	8.408	3	6 24 41.90	2.4801	26 0 33.2	1.049
4	4 28 57.55	2.4128	22 17 44.2	8.269	4	6 27 10.68	2.4793	26 1 31.4	0.890
5	4 31 22.41	2.4159	22 25 56.2	8.130	5	6 29 39.41	2.4785	26 2 20.0	0.731
6	4 33 47.46	2.4190	22 33 59.8	7.989	6	6 32 8.07	2.4770	26 2 59.1	0.573
7	4 36 12.69	2.4221	22 41 54.9	7.848	7	6 34 36.65	2.4758	26 3 28.7	0.413
8	4 38 38.11	2.4251	22 49 41.5	7.705	8	6 37 5.16	2.4745	26 3 48.7	0.254
9	4 41 3.70	2.4280	22 57 19.5	7.562	9	6 39 33.59	2.4731	26 3 59.2	+0.095
10	4 43 29.47	2.4309	23 4 48.9	7.418	10	6 42 1.93	2.4715	26 4 0.1	-0.063
11	4 45 55.41	2.4338	23 12 9.6	7.273	11	6 44 30.17	2.4698	26 3 51.6	0.221
12	4 48 21.52	2.4365	23 19 21.6	7.128	12	6 46 58.30	2.4680	26 3 33.6	0.378
13	4 50 47.79	2.4393	23 26 24.9	6.981	13	6 49 26.33	2.4662	26 3 6.2	0.536
14	4 53 14.23	2.4419	23 33 19.3	6.833	14	6 51 54.24	2.4641	26 2 29.3	0.693
15	4 55 40.82	2.4445	23 40 4.9	6.686	15	6 54 22.02	2.4620	26 1 43.1	0.848
16	4 58 7.57	2.4471	23 46 41.6	6.538	16	6 56 49.68	2.4598	26 0 47.5	1.005
17	5 0 34.47	2.4495	23 53 9.4	6.388	17	6 59 17.20	2.4574	25 59 42.5	1.161
18	5 3 1.51	2.4519	23 59 28.2	6.238	18	7 1 44.57	2.4549	25 58 28.2	1.316
19	5 5 28.70	2.4543	24 5 37.9	6.087	19	7 4 11.79	2.4524	25 57 4.6	1.470
20	5 7 56.02	2.4564	24 11 38.6	5.936	20	7 6 38.86	2.4498	25 55 31.8	1.624
21	5 10 23.47	2.4586	24 17 30.2	5.783	21	7 9 5.77	2.4471	25 53 49.7	1.778
22	5 12 51.05	2.4608	24 23 12.6	5.631	22	7 11 32.51	2.4443	25 51 58.5	1.930
23	5 15 18.76	2.4628	24 28 45.9	5.478	23	7 13 59.08	2.4413	25 49 58.1	2.083
24	5 17 46.58	2.4646	N. 24 34 10.0	5.324	24	7 16 25.47	2.4383	N. 25 47 48.5	2.235
FRIDAY 18.					SUNDAY 20.				
0	5 20 14.51	2.4664	N. 24 39 24.8	5.169	0	7 18 51.68	2.4352	N. 25 45 29.9	2.386
1	5 22 42.55	2.4682	24 44 30.3	5.015	1	7 21 17.69	2.4319	25 43 2.2	2.536
2	5 25 10.70	2.4699	24 49 26.6	4.860	2	7 23 43.51	2.4287	25 40 25.6	2.685
3	5 27 38.94	2.4715	24 54 13.5	4.703	3	7 26 9.13	2.4253	25 37 40.0	2.835
4	5 30 7.28	2.4730	24 58 51.0	4.548	4	7 28 34.54	2.4217	25 34 45.4	2.983
5	5 32 35.70	2.4743	25 3 19.2	4.392	5	7 30 59.73	2.4181	25 31 42.0	3.130
6	5 35 4.20	2.4757	25 7 38.0	4.234	6	7 33 24.71	2.4144	25 28 29.8	3.278
7	5 37 32.78	2.4768	25 11 47.3	4.077	7	7 35 49.46	2.4106	25 25 8.7	3.423
8	5 40 1.42	2.4779	25 15 47.2	3.918	8	7 38 13.98	2.4068	25 21 39.0	3.568
9	5 42 30.13	2.4789	25 19 37.5	3.760	9	7 40 38.27	2.4028	25 18 0.5	3.713
10	5 44 58.89	2.4798	25 23 18.4	3.603	10	7 43 2.32	2.3988	25 14 13.4	3.857
11	5 47 27.71	2.4807	25 26 49.8	3.444	11	7 45 26.12	2.3947	25 10 17.7	3.999
12	5 49 56.57	2.4813	25 30 11.7	3.286	12	7 47 49.68	2.3905	25 6 13.5	4.141
13	5 52 25.47	2.4820	25 33 24.1	3.127	13	7 50 12.98	2.3863	25 2 0.8	4.282
14	5 54 54.41	2.4825	25 36 26.9	2.967	14	7 52 36.03	2.3819	24 57 39.7	4.422
15	5 57 23.37	2.4828	25 39 20.1	2.808	15	7 54 58.81	2.3775	24 53 10.2	4.562
16	5 59 52.35	2.4832	25 42 3.8	2.648	16	7 57 21.33	2.3730	24 48 32.3	4.700
17	6 2 21.35	2.4833	25 44 37.9	2.489	17	7 59 43.57	2.3684	24 43 46.2	4.837
18	6 4 50.35	2.4834	25 47 2.5	2.329	18	8 2 5.54	2.3638	24 38 51.9	4.973
19	6 7 19.36	2.4834	25 49 17.4	2.168	19	8 4 27.23	2.3592	24 33 49.4	5.108
20	6 9 48.36	2.4833	25 51 22.7	2.009	20	8 6 48.64	2.3544	24 28 38.9	5.243
21	6 12 17.35	2.4830	25 53 18.5	1.849	21	8 9 9.76	2.3496	24 23 20.3	5.377
22	6 14 46.32	2.4827	25 55 4.6	1.688	22	8 11 30.59	2.3448	24 17 53.7	5.509
23	6 17 15.27	2.4823	25 56 41.1	1.529	23	8 13 51.13	2.3398	24 12 19.2	5.640
24	6 19 44.19	2.4817	N. 25 58 8.1	1.370	24	8 16 11.37	2.3348	N. 24 6 36.9	5.770

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 21.					WEDNESDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 16 11.37	2.3348	N.24 6 36.9	5.770	0	10 1 57.06	2.0693	N.17 21 14.8	10.663
1	8 18 31.31	2.3298	24 0 46.8	5.899	1	10 4 1.06	2.0639	17 10 32.8	10.736
2	8 20 50.94	2.3247	23 54 49.0	6.028	2	10 6 4.73	2.0585	16 59 46.5	10.808
3	8 23 10.27	2.3196	23 48 43.5	6.155	3	10 8 8.08	2.0533	16 48 55.9	10.878
4	8 25 29.29	2.3144	23 42 30.4	6.281	4	10 10 11.12	2.0480	16 38 1.2	10.946
5	8 27 48.00	2.3092	23 36 9.8	6.406	5	10 12 13.84	2.0428	16 27 2.4	11.014
6	8 30 6.39	2.3038	23 29 41.7	6.529	6	10 14 16.25	2.0376	16 15 59.5	11.082
7	8 32 24.46	2.2986	23 23 6.3	6.652	7	10 16 18.35	2.0324	16 4 52.6	11.148
8	8 34 42.22	2.2933	23 16 23.5	6.773	8	10 18 20.14	2.0273	15 53 41.8	11.212
9	8 36 59.65	2.2878	23 9 33.5	6.893	9	10 20 21.63	2.0223	15 42 27.2	11.275
10	8 39 16.76	2.2824	23 2 36.3	7.013	10	10 22 22.81	2.0171	15 31 8.8	11.337
11	8 41 33.54	2.2769	22 55 31.9	7.132	11	10 24 23.68	2.0121	15 19 46.7	11.398
12	8 43 49.99	2.2714	22 48 20.5	7.248	12	10 26 24.26	2.0072	15 8 21.0	11.458
13	8 46 6.11	2.2660	22 41 2.1	7.364	13	10 28 24.54	2.0023	14 56 51.7	11.517
14	8 48 21.91	2.2605	22 33 36.8	7.478	14	10 30 24.53	1.9974	14 45 18.9	11.575
15	8 50 37.37	2.2548	22 26 4.7	7.592	15	10 32 24.23	1.9926	14 33 42.7	11.632
16	8 52 52.49	2.2493	22 18 25.8	7.704	16	10 34 23.64	1.9878	14 22 3.1	11.688
17	8 55 7.28	2.2437	22 10 40.2	7.816	17	10 36 22.76	1.9830	14 10 20.2	11.742
18	8 57 21.73	2.2380	22 2 47.9	7.926	18	10 38 21.60	1.9783	13 58 34.1	11.795
19	8 59 35.84	2.2324	21 54 49.1	8.034	19	10 40 20.15	1.9736	13 46 44.8	11.848
20	9 1 49.62	2.2268	21 46 43.8	8.142	20	10 42 18.43	1.9691	13 34 52.4	11.898
21	9 4 3.05	2.2210	21 38 32.1	8.248	21	10 44 16.44	1.9645	13 22 57.0	11.948
22	9 6 16.14	2.2153	21 30 14.0	8.353	22	10 46 14.17	1.9600	13 10 58.6	11.998
23	9 8 28.89	2.2097	N.21 21 49.7	8.458	23	10 48 11.64	1.9556	N.12 58 57.3	12.046
TUESDAY 22.					THURSDAY 24.				
0	9 10 41.30	2.2040	N.21 13 19.1	8.561	0	10 50 8.84	1.9511	N.12 46 53.1	12.093
1	9 12 53.37	2.1983	21 4 42.4	8.662	1	10 52 5.77	1.9468	12 34 46.2	12.138
2	9 15 5.09	2.1925	20 55 59.7	8.762	2	10 54 2.45	1.9425	12 22 36.5	12.183
3	9 17 16.47	2.1868	20 47 11.0	8.861	3	10 55 58.87	1.9383	12 10 24.2	12.227
4	9 19 27.51	2.1812	20 38 16.4	8.958	4	10 57 55.04	1.9341	11 58 9.3	12.270
5	9 21 38.21	2.1754	20 29 16.0	9.055	5	10 59 50.96	1.9299	11 45 51.8	12.312
6	9 23 48.56	2.1697	20 20 9.8	9.151	6	11 1 46.63	1.9258	11 33 31.8	12.353
7	9 25 58.57	2.1640	20 10 57.9	9.245	7	11 3 42.05	1.9218	11 21 9.5	12.392
8	9 28 8.24	2.1583	20 1 40.4	9.338	8	11 5 37.24	1.9178	11 8 44.8	12.431
9	9 30 17.57	2.1526	19 52 17.3	9.431	9	11 7 32.19	1.9138	10 56 17.8	12.469
10	9 32 26.55	2.1469	19 42 48.7	9.522	10	11 9 26.90	1.9099	10 43 48.5	12.506
11	9 34 35.20	2.1413	19 33 14.7	9.611	11	11 11 21.38	1.9062	10 31 17.1	12.541
12	9 36 43.50	2.1356	19 23 35.4	9.698	12	11 13 15.64	1.9024	10 18 43.6	12.576
13	9 38 51.47	2.1300	19 13 50.9	9.785	13	11 15 9.67	1.8987	10 6 8.0	12.610
14	9 40 59.10	2.1243	19 4 1.2	9.872	14	11 17 3.48	1.8951	9 53 30.4	12.643
15	9 43 6.39	2.1188	18 54 6.3	9.957	15	11 18 57.08	1.8915	9 40 50.9	12.674
16	9 45 13.35	2.1132	18 44 6.4	10.039	16	11 20 50.46	1.8879	9 28 9.5	12.705
17	9 47 19.97	2.1076	18 34 1.6	10.121	17	11 22 43.63	1.8844	9 15 26.3	12.735
18	9 49 26.26	2.1020	18 23 51.9	10.202	18	11 24 36.59	1.8810	9 2 41.3	12.764
19	9 51 32.21	2.0965	18 13 37.4	10.282	19	11 26 29.35	1.8777	8 49 54.6	12.793
20	9 53 37.84	2.0910	18 3 18.1	10.361	20	11 28 21.91	1.8744	8 37 6.2	12.820
21	9 55 43.13	2.0855	17 52 54.1	10.438	21	11 30 14.28	1.8712	8 24 16.2	12.846
22	9 57 48.10	2.0801	17 42 25.5	10.514	22	11 32 6.45	1.8679	8 11 24.7	12.871
23	9 59 52.74	2.0747	17 31 52.4	10.589	23	11 33 58.43	1.8648	7 58 31.7	12.896
24	10 1 57.06	2.0693	N.17 21 14.8	10.663	24	11 35 50.22	1.8618	N. 7 45 37.2	12.919

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 25.					SUNDAY 27.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 35 50.22	1.8618	N. 7 45 37.2	12.919	0	13 2 50.80	1.7878	S. 2 45 37.5	13.083
1	11 37 41.84	1.8588	7 32 41.4	12.942	1	13 4 38.07	1.7878	2 58 42.0	13.058
2	11 39 33.27	1.8558	7 19 44.2	12.963	2	13 6 25.34	1.7879	3 11 45.6	13.052
3	11 41 24.53	1.8529	7 6 45.8	12.984	3	13 8 12.62	1.7881	3 24 48.2	13.035
4	11 43 15.62	1.8501	6 53 46.1	13.004	4	13 9 59.91	1.7883	3 37 49.8	13.018
5	11 45 6.54	1.8473	6 40 45.3	13.023	5	13 11 47.21	1.7885	3 50 50.4	13.001
6	11 46 57.30	1.8447	6 27 43.3	13.042	6	13 13 34.53	1.7888	4 3 49.9	12.982
7	11 48 47.90	1.8420	6 14 40.3	13.059	7	13 15 21.87	1.7893	4 16 48.2	12.963
8	11 50 38.34	1.8394	6 1 36.2	13.076	8	13 17 9.24	1.7897	4 29 45.4	12.943
9	11 52 28.63	1.8369	5 48 31.2	13.091	9	13 18 56.63	1.7902	4 42 41.4	12.923
10	11 54 18.77	1.8344	5 35 25.3	13.105	10	13 20 44.06	1.7908	4 55 36.1	12.902
11	11 56 8.76	1.8321	5 22 18.6	13.119	11	13 22 31.52	1.7914	5 8 29.6	12.880
12	11 57 58.62	1.8298	5 9 11.0	13.132	12	13 24 19.03	1.7922	5 21 21.7	12.857
13	11 59 48.34	1.8275	4 56 2.7	13.144	13	13 26 6.58	1.7929	5 34 12.4	12.834
14	12 1 37.92	1.8253	4 42 53.7	13.156	14	13 27 54.18	1.7938	5 47 1.8	12.811
15	12 3 27.37	1.8231	4 29 44.0	13.167	15	13 29 41.83	1.7947	5 59 49.7	12.786
16	12 5 16.69	1.8210	4 16 33.7	13.177	16	13 31 29.54	1.7956	6 12 36.1	12.760
17	12 7 5.89	1.8190	4 3 22.8	13.186	17	13 33 17.30	1.7966	6 25 20.9	12.733
18	12 8 54.97	1.8171	3 50 11.4	13.193	18	13 35 5.13	1.7977	6 38 4.1	12.708
19	12 10 43.94	1.8152	3 36 59.6	13.201	19	13 36 53.02	1.7988	6 50 45.8	12.681
20	12 12 32.79	1.8133	3 23 47.3	13.208	20	13 38 40.98	1.8000	7 3 25.8	12.553
21	12 14 21.54	1.8116	3 10 34.7	13.213	21	13 40 29.02	1.8013	7 16 4.1	12.623
22	12 16 10.18	1.8099	2 57 21.8	13.218	22	13 42 17.13	1.8026	7 28 40.6	12.594
23	12 17 58.72	1.8082	N. 2 44 8.6	13.223	23	13 44 5.33	1.8040	S. 7 41 15.4	12.564
SATURDAY 26.					MONDAY 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 19 47.16	1.8066	N. 2 30 55.1	13.226	0	13 45 53.61	1.8054	S. 7 53 48.3	12.533
1	12 21 35.51	1.8052	2 17 41.5	13.228	1	13 47 41.98	1.8069	8 6 19.4	12.502
2	12 23 23.78	1.8038	2 4 27.7	13.230	2	13 49 30.44	1.8085	8 18 48.6	12.470
3	12 25 11.96	1.8024	1 51 13.9	13.231	3	13 51 19.00	1.8102	8 31 15.8	12.437
4	12 27 0.06	1.8010	1 38 0.0	13.232	4	13 53 7.66	1.8119	8 43 41.0	12.403
5	12 28 48.08	1.7997	1 24 46.1	13.231	5	13 54 56.43	1.8137	8 56 4.2	12.370
6	12 30 36.02	1.7985	1 11 32.3	13.229	6	13 56 45.30	1.8154	9 8 25.4	12.335
7	12 32 23.90	1.7974	0 58 18.6	13.228	7	13 58 34.28	1.8173	9 20 44.4	12.299
8	12 34 11.71	1.7963	0 45 5.0	13.225	8	14 0 23.37	1.8192	9 33 1.3	12.263
9	12 35 59.46	1.7953	0 31 51.6	13.222	9	14 2 12.58	1.8213	9 45 16.0	12.228
10	12 37 47.15	1.7943	0 18 38.4	13.218	10	14 4 1.92	1.8233	9 57 28.4	12.188
11	12 39 34.78	1.7935	N. 0 5 25.5	13.213	11	14 5 51.38	1.8254	10 9 38.6	12.151
12	12 41 22.37	1.7928	S. 0 7 47.1	13.207	12	14 7 40.97	1.8276	10 21 46.5	12.112
13	12 43 9.91	1.7919	0 20 59.3	13.200	13	14 9 30.69	1.8298	10 33 52.0	12.072
14	12 44 57.40	1.7912	0 34 11.1	13.193	14	14 11 20.55	1.8322	10 45 55.1	12.032
15	12 46 44.86	1.7907	0 47 22.4	13.185	15	14 13 10.55	1.8345	10 57 55.8	11.991
16	12 48 32.28	1.7900	1 0 33.3	13.177	16	14 15 0.69	1.8369	11 9 54.0	11.948
17	12 50 19.66	1.7895	1 13 43.6	13.168	17	14 16 50.98	1.8394	11 21 49.6	11.906
18	12 52 7.02	1.7892	1 26 53.4	13.158	18	14 18 41.42	1.8419	11 33 42.7	11.863
19	12 53 54.36	1.7888	1 40 2.5	13.147	19	14 20 32.01	1.8445	11 45 33.2	11.819
20	12 55 41.67	1.7884	1 53 11.0	13.136	20	14 22 22.76	1.8472	11 57 21.0	11.774
21	12 57 28.97	1.7882	2 6 18.8	13.123	21	14 24 13.67	1.8499	12 9 6.1	11.729
22	12 59 16.25	1.7880	2 19 25.8	13.111	22	14 26 4.75	1.8527	12 20 48.5	11.683
23	13 1 3.53	1.7879	2 32 32.1	13.098	23	14 27 55.99	1.8555	12 32 28.1	11.637
24	13 2 50.80	1.7878	S. 2 45 37.5	13.083	24	14 29 47.41	1.8584	S. 12 44 4.9	11.589



GREENWICH MEAN TIME.

PHASES OF THE MOON.

☾ Last Quarter . . . . .	Feb.	d	h	m
	1	23	27.1	
● New Moon . . . . .	9	13	13.0	
☾ First Quarter . . . . .	16	6	32.5	
○ Full Moon . . . . .	23	15	35.8	

☾ Perigee . . . . .	Feb.	d	h
	12	10.0	
☾ Apogee . . . . .	28	10.6	

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Pollux W.	98 49 28	3078	100 18 4	3077	101 46 41	3075	103 15 21	3073
	Regulus W.	62 38 13	3090	64 6 35	3089	65 34 58	3087	67 3 24	3084
	JUPITER W.	16 42 49	3114	18 10 42	3107	19 38 43	3100	21 6 52	3094
	Antares E.	37 59 10	3105	36 31 6	3106	35 3 4	3107	33 35 3	3108
	SUN E.	100 32 58	3478	99 12 9	3476	97 51 19	3474	96 30 26	3472
2	Regulus W.	74 26 36	3064	75 55 30	3058	77 24 31	3052	78 53 39	3046
	JUPITER W.	28 29 40	3061	29 58 37	3054	31 27 43	3047	32 56 57	3040
	Spica W.	20 49 4	3199	22 15 14	3177	23 41 51	3157	25 8 53	3138
	SUN E.	89 45 10	3452	88 23 52	3446	87 2 28	3439	85 40 56	3433
3	Regulus W.	86 21 27	3007	87 51 31	2998	89 21 45	2989	90 52 11	2979
	JUPITER W.	40 25 35	2997	41 55 52	2987	43 26 20	2977	44 57 1	2967
	Spica W.	32 29 11	3060	33 58 10	3046	35 27 25	3032	36 56 58	3018
	SUN E.	78 51 15	3392	77 28 50	3383	76 6 14	3373	74 43 26	3362
4	Regulus W.	98 27 39	2924	99 59 27	2912	101 31 31	2899	103 3 51	2886
	JUPITER W.	52 33 51	2909	54 5 58	2897	55 38 21	2884	57 11 0	2870
	Spica W.	44 28 59	2950	46 0 15	2935	47 31 50	2920	49 3 43	2905
	SUN E.	67 46 16	3303	66 22 8	3290	64 57 46	3277	63 33 8	3263
5	JUPITER W.	64 58 43	2800	66 33 11	2785	68 7 59	2770	69 43 6	2754
	Spica W.	56 47 53	2831	58 21 41	2815	59 55 50	2799	61 30 20	2783
	SUN E.	56 25 50	3192	54 59 31	3176	53 32 53	3161	52 5 57	3145
6	JUPITER W.	77 43 54	2676	79 21 6	2660	80 58 40	2643	82 36 36	2627
	Spica W.	69 28 3	2702	71 4 40	2685	72 41 40	2669	74 19 1	2652
	Antares W.	23 40 12	2749	25 15 47	2725	26 51 53	2703	28 28 29	2681
	SUN E.	44 46 35	3067	43 17 45	3052	41 48 37	3037	40 19 10	3022
7	JUPITER W.	90 51 50	2545	92 32 0	2530	94 12 32	2514	95 53 26	2498
	Spica W.	82 31 22	2571	84 10 57	2555	85 50 54	2539	87 31 14	2523
	Antares W.	36 38 28	2583	38 17 46	2565	39 57 29	2547	41 37 37	2529
	SUN E.	32 47 20	2952	31 16 7	2940	29 44 39	2929	28 12 57	2920
11	SUN W.	20 2 35	2628	21 40 52	2607	23 19 37	2589	24 58 47	2574
	MARS E.	60 14 25	2376	58 30 16	2372	56 46 1	2368	55 1 40	2365
	Aldebaran E.	86 44 9	2209	84 55 55	2205	83 7 35	2202	81 19 10	2199
12	SUN W.	33 18 39	2532	34 59 8	2527	36 39 43	2524	38 20 23	2522
	MARS E.	46 19 10	2359	44 34 37	2360	42 50 4	2361	41 5 33	2363
	Aldebaran E.	72 16 17	2192	70 27 39	2193	68 39 1	2194	66 50 25	2196
	Pollux E.	116 21 39	2174	114 32 33	2174	112 43 26	2174	110 54 20	2175
13	SUN W.	46 44 3	2523	48 24 44	2525	50 5 23	2527	51 45 58	2530
	MARS E.	32 23 53	2380	30 39 50	2386	28 55 55	2392	27 12 9	2399
	Aldebaran E.	57 48 14	2212	56 0 4	2217	54 12 1	2222	52 24 6	2227
	Pollux E.	101 49 16	2185	100 0 26	2188	98 11 40	2192	96 23 0	2196
14	SUN W.	60 7 34	2553	61 47 33	2559	63 27 24	2565	65 7 7	2571
	Aldebaran E.	43 26 58	2266	41 40 8	2275	39 53 32	2285	38 7 11	2297
	Pollux E.	87 21 18	2221	85 33 22	2227	83 45 34	2231	81 57 55	2239

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
1	Pollux W. Regulus W. JUPITER W. Antares E. SUN E.	104 44 3 68 31 54 22 35 9 32 7 3 95 9 31	3070 3081 3087 3109 3469	106 12 48 70 0 27 24 3 35 30 39 4 93 48 32	3067 3077 3080 3110 3465	107 41 37 71 29 5 25 32 9 29 11 6 92 27 29	3064 3073 3073 3110 3462	109 10 31 72 57 48 27 0 51 27 43 9 91 6 22	3060 3069 3067 3110 3457
2	Regulus W. JUPITER W. Spica W. SUN E.	80 22 54 34 26 20 26 36 17 84 19 17	3039 3032 3120 3426	81 52 18 35 55 53 28 4 2 82 57 30	3032 3024 3104 3418	83 21 51 37 25 36 29 32 7 81 35 35	3024 3015 3089 3410	84 51 34 38 55 30 31 0 30 80 13 30	3016 3006 3074 3401
3	Regulus W. JUPITER W. Spica W. SUN E.	92 22 50 46 27 54 38 26 48 73 20 26	2969 2956 3004 3351	93 53 41 47 59 1 39 56 56 71 57 13	2958 2945 2991 3340	95 24 46 49 30 23 41 27 20 70 33 48	2947 2933 2977 3328	96 56 5 51 1 59 42 58 1 69 10 9	2935 2921 2964 3316
4	Regulus W. JUPITER W. Spica W. SUN E.	104 36 27 58 43 57 50 35 55 62 8 14	2873 2857 2891 3249	106 9 20 60 17 11 52 8 25 60 43 3	2860 2843 2876 3235	107 42 30 61 50 43 53 41 15 59 17 36	2847 2829 2861 3220	109 15 57 63 24 34 55 14 24 57 51 51	2833 2815 2846 3206
5	JUPITER W. Spica W. SUN E.	71 18 34 63 5 10 50 38 42	2738 2767 3129	72 54 23 64 40 22 49 11 8	2723 2751 3114	74 30 32 66 15 54 47 43 16	2707 2735 3099	76 7 2 67 51 48 46 15 5	2691 2719 3083
6	JUPITER W. Spica W. Antares W. SUN E.	84 14 54 75 56 45 30 5 34 38 49 24	2611 2636 2660 3007	85 53 34 77 34 51 31 43 7 37 19 20	2594 2620 2640 2992	87 32 37 79 13 19 33 21 8 35 48 57	2578 2604 2621 2978	89 12 2 80 52 9 34 59 35 34 18 17	2561 2587 2602 2965
7	JUPITER W. Spica W. Antares W. SUN E.	97 34 42 89 11 55 43 18 10 26 41 2	2482 2508 2512 2912	99 16 20 90 52 57 44 59 6 25 8 58	2467 2492 2495 2906	100 58 19 92 34 21 46 40 26 23 36 46	2452 2477 2479 2901	102 40 40 94 16 7 48 22 9 22 4 28	2436 2462 2463 2898
11	SUN W. MARS E. Aldebaran E.	26 38 17 53 17 15 79 30 41	2562 2363 2196	28 18 4 51 32 47 77 42 8	2552 2361 2195	29 58 5 49 48 16 75 53 33	2544 2360 2194	31 38 17 48 3 43 74 4 56	2537 2359 2193
12	SUN W. MARS E. Aldebaran E. Pollux E.	40 1 5 39 21 5 65 1 51 109 5 14	2521 2365 2198 2176	41 41 49 37 36 40 63 13 20 107 16 10	2520 2368 2201 2178	43 22 34 35 52 19 61 24 53 105 27 9	2520 2371 2204 2180	45 3 19 34 8 3 59 36 31 103 38 11	2521 2375 2208 2182
13	SUN W. MARS E. Aldebaran E. Pollux E.	53 26 29 25 28 32 50 36 19 94 34 25	2534 2407 2234 2200	55 6 54 23 45 7 48 48 42 92 45 57	2538 2417 2241 2205	56 47 14 22 1 56 47 1 16 90 57 36	2543 2428 2249 2210	58 27 27 20 19 1 45 14 1 89 9 23	2548 2441 2257 2215
14	SUN W. Aldebaran E. Pollux E.	66 46 42 36 21 7 80 10 26	2578 2309 2246	68 26 7 34 35 21 78 23 7	2585 2323 2253	70 5 23 32 49 55 76 35 58	2592 2337 2260	71 44 29 31 4 50 74 49 0	2599 2353 2267

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
14	Regulus	E.	123 32 32	2235	121 44 56	2239	119 57 27	2245	118 10 7	2251
15	SUN	W.	73 23 25	2607	75 2 10	2615	76 40 45	2623	78 19 9	2631
	SATURN	W.	20 4 45	2304	21 50 39	2311	23 36 23	2318	25 21 57	2325
	Aldebaran	E.	29 20 8	2371	27 35 52	2393	25 52 7	2417	24 8 56	2444
	Pollux	E.	73 2 12	2275	71 15 35	2283	69 29 10	2290	67 42 56	2298
	Regulus	E.	109 15 42	2284	107 29 19	2291	105 43 6	2298	103 57 4	2306
16	SUN	W.	86 28 16	2675	88 5 30	2684	89 42 32	2692	91 19 22	2701
	SATURN	W.	34 7 1	2364	35 51 27	2372	37 35 42	2380	39 19 45	2389
	MARS	W.	9 18 28	2695	10 55 15	2661	12 32 47	2639	14 10 49	2626
	Pollux	E.	58 54 45	2340	57 9 44	2348	55 24 55	2357	53 40 19	2366
	Regulus	E.	95 9 47	2346	93 24 55	2354	91 40 14	2363	89 55 46	2371
17	SUN	W.	99 20 29	2748	100 56 5	2757	102 31 29	2767	104 6 40	2777
	SATURN	W.	47 56 56	2432	49 39 46	2440	51 22 23	2449	53 4 49	2458
	α Arietis	W.	32 12 46	2756	33 48 12	2734	35 24 7	2716	37 0 25	2702
	MARS	W.	22 22 58	2686	24 1 18	2631	25 39 31	2637	27 17 36	2643
	Pollux	E.	45 0 32	2412	43 17 14	2421	41 34 9	2430	39 51 17	2440
	Regulus	E.	81 16 28	2415	79 33 14	2423	77 50 12	2432	76 7 22	2441
	JUPITER	E.	126 39 49	2387	124 55 56	2395	123 12 15	2403	121 28 45	2412
18	SUN	W.	111 59 29	2825	113 33 25	2834	115 7 9	2844	116 40 40	2853
	SATURN	W.	61 33 54	2501	63 15 6	2509	64 56 7	2517	66 36 56	2526
	α Arietis	W.	45 5 34	2666	46 42 59	2664	48 20 28	2663	49 57 58	2662
	MARS	W.	35 25 44	2679	37 2 52	2687	38 39 49	2695	40 16 36	2703
	Aldebaran	W.	14 15 26	2838	15 49 5	2780	17 23 59	2736	18 59 53	2704
	Pollux	E.	31 20 27	2490	29 39 0	2501	27 57 48	2512	26 16 52	2525
	Regulus	E.	67 36 22	2485	65 54 48	2494	64 13 26	2503	62 32 16	2512
	JUPITER	E.	112 54 13	2453	111 11 54	2461	109 29 46	2470	107 47 50	2478
	Spica	E.	121 38 39	2494	119 57 17	2502	118 16 6	2510	116 35 6	2517
19	SATURN	W.	74 58 3	2569	76 37 41	2577	78 17 8	2585	79 56 23	2593
	α Arietis	W.	58 5 11	2673	59 42 27	2677	61 19 38	2681	62 56 44	2685
	MARS	W.	48 17 48	2744	49 53 29	2752	51 29 0	2760	53 4 20	2769
	Aldebaran	W.	27 6 28	2643	28 44 25	2640	30 22 25	2640	32 0 25	2641
	Regulus	E.	54 9 37	2557	52 29 44	2567	50 50 3	2576	49 10 36	2585
	JUPITER	E.	99 21 3	2519	97 40 16	2527	95 59 40	2535	94 19 16	2543
	Spica	E.	108 12 50	2557	106 32 56	2565	104 53 12	2573	103 13 40	2580
20	SATURN	W.	88 9 46	2636	89 47 52	2644	91 25 47	2652	93 3 31	2660
	α Arietis	W.	71 0 33	2713	72 36 56	2719	74 13 10	2725	75 49 16	2732
	MARS	W.	60 58 10	2811	62 32 23	2820	64 6 25	2828	65 40 16	2836
	Aldebaran	W.	40 9 49	2657	41 47 27	2662	43 24 58	2667	45 2 22	2672
	Regulus	E.	40 56 35	2635	39 18 28	2646	37 40 36	2657	36 2 59	2669
	JUPITER	E.	86 0 3	2584	84 20 46	2592	82 41 40	2600	81 2 45	2608
	Spica	E.	94 58 43	2621	93 20 17	2630	91 42 3	2638	90 3 59	2646
21	SATURN	W.	101 9 20	2703	102 45 56	2711	104 22 20	2720	105 58 34	2729
	α Arietis	W.	83 47 27	2769	85 22 36	2775	86 57 34	2785	88 32 21	2793
	MARS	W.	73 26 46	2880	74 59 31	2889	76 32 4	2898	78 4 26	2906
	Aldebaran	W.	53 7 23	2705	54 43 57	2712	56 20 21	2719	57 56 36	2726

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LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
14	Regulus E.	116 22 56	2257	114 35 53	2264	112 49 0	2270	111 2 16	2277
15	SUN W.	79 57 21	2639	81 35 22	2648	83 13 12	2657	84 50 50	2666
	SATURN W.	27 7 20	2333	28 52 32	2340	30 37 33	2348	32 22 23	2356
	Aldebaran E.	22 26 23	2477	20 44 36	2517	19 3 45	2566	17 24 2	2624
	Pollux E.	65 56 54	2306	64 11 4	2314	62 25 25	2323	60 39 59	2331
	Regulus E.	102 11 14	2314	100 25 35	2322	98 40 7	2330	96 54 51	2338
16	SUN W.	92 56 0	2710	94 32 26	2720	96 8 39	2729	97 44 40	2738
	SATURN W.	41 3 36	2398	42 47 14	2406	44 30 40	2415	46 13 54	2423
	MARS W.	15 49 9	2620	17 27 36	2619	19 6 5	2620	20 44 33	2628
	Pollux E.	51 55 56	2375	50 11 46	2384	48 27 48	2393	46 44 3	2403
	Regulus E.	88 11 29	2380	86 27 25	2389	84 43 34	2397	82 59 55	2406
17	SUN W.	105 41 38	2786	107 16 24	2795	108 50 58	2805	110 25 20	2815
	SATURN W.	54 47 2	2466	56 29 3	2475	58 10 52	2483	59 52 29	2492
	α Arietis W.	38 37 2	2691	40 13 54	2682	41 50 59	2675	43 28 13	2670
	MARS W.	28 55 32	2650	30 33 19	2657	32 10 57	2664	33 48 25	2671
	Pollux E.	38 8 39	2450	36 26 15	2460	34 44 5	2470	33 2 9	2480
	Regulus E.	74 24 45	2450	72 42 21	2458	71 0 9	2467	69 18 9	2476
	JUPITER E.	119 45 27	2420	118 2 21	2428	116 19 27	2436	114 36 44	2445
18	SUN W.	118 13 59	2863	119 47 5	2873	121 19 59	2883	122 52 40	2892
	SATURN W.	68 17 33	2535	69 57 58	2543	71 38 11	2551	73 18 13	2560
	α Arietis W.	51 35 29	2663	53 12 59	2665	54 50 26	2667	56 27 50	2669
	MARS W.	41 53 12	2711	43 29 37	2719	45 5 52	2727	46 41 55	2735
	Aldebaran W.	20 36 28	2682	22 13 32	2666	23 50 57	2655	25 28 37	2647
	Pollux E.	24 36 13	2538	22 55 52	2552	21 15 50	2568	19 36 10	2586
	Regulus E.	60 51 19	2521	59 10 35	2530	57 30 3	2539	55 49 44	2548
	JUPITER E.	106 6 6	2486	104 24 33	2494	102 43 12	2502	101 2 2	2510
	Spica E.	114 54 17	2525	113 13 39	2533	111 33 12	2541	109 52 56	2549
19	SATURN W.	81 35 27	2602	83 14 19	2611	84 52 59	2619	86 31 28	2627
	α Arietis W.	64 33 44	2690	66 10 37	2695	67 47 23	2701	69 24 2	2707
	MARS W.	54 39 28	2778	56 14 25	2786	57 49 11	2795	59 23 46	2803
	Aldebaran W.	33 38 24	2643	35 16 21	2645	36 54 15	2648	38 32 5	2652
	Regulus E.	47 31 21	2595	45 52 19	2605	44 13 31	2615	42 34 56	2625
	JUPITER E.	92 39 3	2551	90 59 1	2559	89 19 11	2567	87 39 31	2576
	Spica E.	101 34 18	2588	99 55 8	2596	98 16 8	2605	96 37 20	2613
20	SATURN W.	94 41 4	2669	96 18 25	2678	97 55 35	2687	99 32 33	2695
	α Arietis W.	77 25 13	2739	79 1 1	2746	80 36 39	2753	82 12 8	2761
	MARS W.	67 13 57	2845	68 47 26	2854	70 20 44	2863	71 53 51	2872
	Aldebaran W.	46 39 39	2678	48 16 48	2685	49 53 48	2691	51 30 40	2698
	Regulus E.	34 25 37	2681	32 48 31	2693	31 11 41	2706	29 35 9	2720
	JUPITER E.	79 24 2	2616	77 45 29	2625	76 7 8	2633	74 28 58	2641
	Spica E.	88 26 7	2655	86 48 26	2663	85 10 56	2671	83 33 37	2680
21	SATURN W.	107 34 36	2737	109 10 27	2746	110 46 6	2754	112 21 34	2763
	α Arietis W.	90 6 58	2801	91 41 24	2810	93 15 39	2819	94 49 43	2828
	MARS W.	79 36 37	2915	81 8 37	2924	82 40 25	2932	84 12 3	2941
	Aldebaran W.	59 32 41	2734	61 8 36	2741	62 44 22	2749	64 19 57	2756

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
21	Regulus E.	27 58 55	2735	26 23 1	2751	24 47 30	2770	23 12 22	2790
	JUPITER E.	72 50 59	2649	71 13 11	2658	69 35 35	2666	67 58 9	2675
	Spica E.	81 56 30	2688	80 19 34	2697	78 42 50	2705	77 6 17	2713
22	α Arietis W.	96 23 35	2837	97 57 15	2846	99 30 44	2855	101 4 0	2865
	MARS W.	85 43 30	2950	87 14 46	2959	88 45 50	2968	90 16 43	2977
	Aldebaran W.	65 55 23	2764	67 30 38	2772	69 5 43	2780	70 40 37	2788
	Pollux W.	21 45 8	2774	23 20 10	2778	24 55 7	2783	26 29 57	2789
	JUPITER E.	59 53 50	2716	58 17 32	2725	56 41 25	2733	55 5 29	2742
	Spica E.	69 6 25	2758	67 31 2	2767	65 55 51	2776	64 20 52	2785
	Antares E.	114 59 36	2750	113 24 2	2758	111 48 39	2766	110 13 26	2774
23	α Arietis W.	108 47 12	2916	110 19 11	2927	111 50 56	2938	113 22 27	2950
	MARS W.	97 48 20	3022	99 18 5	3030	100 47 40	3039	102 17 4	3048
	Aldebaran W.	78 32 30	2829	80 6 20	2837	81 39 59	2845	83 13 28	2854
	Pollux W.	34 22 9	2821	35 56 9	2828	37 30 0	2836	39 3 41	2844
	JUPITER E.	47 8 41	2785	45 33 53	2794	43 59 17	2803	42 24 53	2811
	Spica E.	56 28 54	2832	54 55 7	2842	53 21 33	2851	51 48 11	2860
	Antares E.	102 20 6	2816	100 45 59	2824	99 12 2	2833	97 38 17	2841
24	Aldebaran W.	90 58 10	2896	92 30 34	2904	94 2 47	2912	95 34 50	2921
	Pollux W.	46 49 39	2883	48 22 20	2891	49 54 51	2898	51 27 12	2905
	Regulus W.	11 21 47	3205	12 47 50	3141	14 15 6	3102	15 43 13	3072
	JUPITER E.	34 35 42	2855	33 2 26	2865	31 29 22	2874	29 56 30	2883
	Spica E.	44 4 31	2912	42 32 27	2922	41 0 36	2933	39 28 59	2944
	Antares E.	89 52 13	2883	88 19 33	2891	86 47 3	2899	85 14 43	2908
25	Aldebaran W.	103 12 25	2962	104 43 25	2970	106 14 15	2978	107 44 55	2996
	Pollux W.	59 6 31	2944	60 37 54	2952	62 9 7	2959	63 40 11	2966
	Regulus W.	23 9 48	3021	24 39 35	3019	26 9 24	3020	27 39 12	3021
	JUPITER E.	22 15 12	2933	20 43 35	2944	19 12 12	2956	17 41 5	2970
	Spica E.	31 54 33	3005	30 24 27	3020	28 54 39	3035	27 25 10	3051
	Antares E.	77 35 43	2948	76 4 26	2956	74 33 18	2964	73 2 20	2971
	α Aquilæ E.	120 31 55	4068	119 21 22	4043	118 10 25	4020	116 59 4	3999
26	Aldebaran W.	115 15 49	3024	116 45 32	3032	118 15 5	3039	119 44 30	3046
	Pollux W.	71 13 19	3001	72 43 31	3007	74 13 35	3013	75 43 32	3019
	Regulus W.	35 7 39	3035	36 37 8	3038	38 6 34	3042	39 35 55	3046
	Antares E.	65 29 48	3007	63 59 44	3014	62 29 49	3021	61 0 3	3027
	α Aquilæ E.	110 57 46	3920	109 44 47	3910	108 31 37	3901	107 18 18	3892
27	Pollux W.	83 11 29	3046	84 40 45	3050	86 9 56	3054	87 39 1	3058
	Regulus W.	47 1 25	3065	48 30 17	3069	49 59 4	3072	51 27 47	3075
	Antares E.	53 33 4	3056	52 4 1	3062	50 35 5	3067	49 6 15	3072
	α Aquilæ E.	101 9 54	3865	99 55 59	3862	98 42 1	3860	97 28 1	3858
28	Pollux W.	95 3 23	3074	96 32 4	3076	98 0 43	3078	99 29 20	3079
	Regulus W.	58 50 36	3087	60 19 1	3088	61 47 25	3090	63 15 47	3091
	JUPITER W.	14 16 13	3085	15 44 41	3079	17 13 16	3075	18 41 56	3071
	Antares E.	41 43 29	3093	40 15 11	3096	38 46 57	3100	37 18 47	3103
	α Aquilæ E.	91 17 50	3861	90 3 51	3863	88 49 54	3865	87 35 59	3868
	SUN E.	131 33 35	3483	130 12 52	3485	128 52 11	3486	127 31 31	3487

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## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
21	Regulus	E.	21 37 40	2812	20 3 28	2838	18 29 50	2869	16 56 52	2907
	JUPITER	E.	66 20 55	2683	64 43 52	2691	63 7 0	2699	61 30 19	2708
	Spica	E.	75 29 55	2722	73 53 45	2731	72 17 47	2740	70 42 0	2749
22	α Arietis	W.	102 37 4	2875	104 9 55	2884	105 42 34	2894	107 15 0	2905
	MARS	W.	91 47 25	2986	93 17 56	2995	94 48 15	3004	96 18 23	3013
	Aldebaran	W.	72 15 21	2796	73 49 54	2804	75 24 17	2812	76 58 29	2821
	Pollux	W.	28 4 39	2795	29 39 14	2801	31 13 41	2808	32 47 59	2814
	JUPITER	E.	53 29 45	2751	51 54 12	2760	50 18 51	2768	48 43 40	2776
	Spica	E.	62 46 4	2794	61 11 29	2803	59 37 5	2812	58 2 53	2822
	Antares	E.	108 38 24	2782	107 3 33	2791	105 28 53	2799	103 54 24	2808
23	α Arietis	W.	114 53 44	2961	116 24 46	2972	117 55 34	2984	119 26 7	2996
	MARS	W.	103 46 17	3057	105 15 18	3066	106 44 9	3075	108 12 49	3084
	Aldebaran	W.	84 46 46	2862	86 19 53	2871	87 52 49	2879	89 25 35	2887
	Pollux	W.	40 37 13	2852	42 10 34	2859	43 43 46	2867	45 16 47	2875
	JUPITER	E.	40 50 40	2820	39 16 38	2829	37 42 48	2838	36 9 9	2847
	Spica	E.	50 15 1	2870	48 42 4	2880	47 9 20	2890	45 36 49	2901
	Antares	E.	96 4 42	2850	94 31 19	2858	92 58 6	2866	91 25 4	2875
24	Aldebaran	W.	97 6 42	2930	98 38 23	2938	100 9 54	2946	101 41 15	2954
	Pollux	W.	52 59 24	2913	54 31 26	2921	56 3 17	2929	57 34 59	2937
	Regulus	W.	17 11 57	3052	18 41 6	3059	20 10 30	3067	21 40 5	3074
	JUPITER	E.	28 23 50	2893	26 51 22	2902	25 19 6	2912	23 47 3	2922
	Spica	E.	37 57 36	2956	36 26 27	2968	34 55 34	2980	33 24 56	2992
	Antares	E.	83 42 34	2916	82 10 36	2924	80 38 48	2932	79 7 10	2941
25	Aldebaran	W.	109 15 25	2994	110 45 45	3001	112 15 56	3009	113 45 57	3017
	Pollux	W.	65 11 7	2973	66 41 53	2980	68 12 31	2987	69 42 59	2994
	Regulus	W.	29 8 59	3022	30 38 44	3024	32 8 27	3027	33 38 6	3032
	JUPITER	E.	16 10 14	2985	14 39 42	3003	13 9 32	3024	11 39 49	3051
	Spica	E.	25 56 0	3069	24 27 12	3090	22 58 50	3112	21 30 55	3135
	Antares	E.	71 31 31	2979	70 0 52	2986	68 30 22	2993	67 0 1	3000
	α Aquilæ	E.	115 47 23	3979	114 35 23	3962	113 23 6	3946	112 10 33	3932
26	Aldebaran	W.	121 13 46	3053	122 42 54	3060	124 11 53	3066	125 40 44	3073
	Pollux	W.	77 13 21	3025	78 43 3	3030	80 12 38	3035	81 42 7	3041
	Regulus	W.	41 5 10	3050	42 34 21	3054	44 3 27	3058	45 32 28	3061
	Antares	E.	59 30 24	3034	58 0 53	3040	56 31 30	3046	55 2 14	3051
	α Aquilæ	E.	106 4 50	3885	104 51 15	3878	103 37 33	3873	102 23 46	3868
27	Pollux	W.	89 8 2	3062	90 36 58	3065	92 5 50	3068	93 34 38	3071
	Regulus	W.	52 56 27	3078	54 25 3	3080	55 53 37	3082	57 22 8	3085
	Antares	E.	47 37 31	3077	46 8 53	3081	44 40 20	3085	43 11 52	3089
	α Aquilæ	E.	96 13 59	3858	94 59 57	3857	93 45 54	3858	92 31 51	3859
28	Pollux	W.	100 57 55	3080	102 26 29	3081	103 55 2	3081	105 23 35	3081
	Regulus	W.	64 44 7	3091	66 12 27	3091	67 40 47	3091	69 9 7	3091
	JUPITER	W.	20 10 40	3068	21 39 29	3065	23 8 21	3063	24 37 16	3060
	Antares	E.	35 50 41	3106	34 22 39	3109	32 54 40	3112	31 26 45	3115
	α Aquilæ	E.	86 22 8	3872	85 8 20	3877	83 54 37	3882	82 40 58	3887
	SUN	E.	126 10 52	3487	124 50 13	3487	123 29 34	3486	122 8 54	3484

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.						
		Apparent Right Ascension.			Diff. for 1 Hour.	Apparent Declination.					Diff. for 1 Hour.	Semi-diameter.				
		h	m	s	s	°	'	"	"	'	"	s	m	s	s	
Tues.	1	22	46	18.14	9.373	S.	7	48	26.0	+56.80	16	10.16	65.46	12	37.60	0.481
Wed.	2	22	50	2.87	9.353		7	25	39.4	57.08	16	9.91	65.38	12	25.83	0.501
Thur.	3	22	53	47.12	9.334		7	2	46.4	57.34	16	9.66	65.30	12	13.57	0.522
Frid.	4	22	57	30.89	9.315		6	39	47.3	+57.58	16	9.40	65.23	12	0.82	0.542
Sat.	5	23	1	14.22	9.297		6	16	42.6	57.81	16	9.15	65.16	11	47.62	0.560
SUN.	6	23	4	57.13	9.279		5	53	32.6	58.02	16	8.90	65.10	11	34.01	0.577
Mon.	7	23	8	39.62	9.262		5	30	17.6	+58.22	16	8.64	65.04	11	19.99	0.593
Tues.	8	23	12	21.71	9.246		5	6	58.0	58.40	16	8.38	64.98	11	5.58	0.609
Wed.	9	23	16	3.43	9.230		4	43	34.4	58.56	16	8.11	64.92	10	50.78	0.624
Thur.	10	23	19	44.79	9.215		4	20	7.0	+58.71	16	7.85	64.87	10	35.62	0.638
Frid.	11	23	23	25.81	9.202		3	56	36.3	58.84	16	7.60	64.82	10	20.12	0.652
Sat.	12	23	27	6.50	9.189		3	33	2.7	58.95	16	7.34	64.78	10	4.30	0.664
SUN.	13	23	30	46.87	9.176		3	9	26.6	+59.04	16	7.08	64.74	9	48.17	0.676
Mon.	14	23	34	26.95	9.164		2	45	48.4	59.12	16	6.82	64.70	9	31.73	0.687
Tues.	15	23	38	6.75	9.153		2	22	8.5	59.18	16	6.56	64.66	9	15.01	0.699
Wed.	16	23	41	46.27	9.142		1	58	27.3	+59.23	16	6.30	64.62	8	58.03	0.710
Thur.	17	23	45	25.55	9.132		1	34	45.2	59.26	16	6.03	64.59	8	40.81	0.720
Frid.	18	23	49	4.61	9.123		1	11	2.7	59.28	16	5.77	64.56	8	23.37	0.730
Sat.	19	23	52	43.47	9.115		0	47	20.1	+59.28	16	5.51	64.53	8	5.73	0.739
SUN.	20	23	56	22.15	9.108	S.	0	23	37.6	59.26	16	5.24	64.51	7	47.90	0.747
Mon.	21	0	0	0.66	9.102	N.	0	0	4.4	59.23	16	4.97	64.49	7	29.91	0.753
Tues.	22	0	3	39.04	9.097		0	23	45.4	+59.18	16	4.70	64.48	7	11.79	0.758
Wed.	23	0	7	17.31	9.093		0	47	25.1	59.12	16	4.43	64.47	6	53.56	0.762
Thur.	24	0	10	55.50	9.089		1	11	3.3	59.04	16	4.16	64.46	6	35.24	0.765
Frid.	25	0	14	33.62	9.087		1	34	39.7	+58.95	16	3.88	64.45	6	16.84	0.767
Sat.	26	0	18	11.68	9.086		1	58	13.7	58.86	16	3.60	64.44	5	58.40	0.768
SUN.	27	0	21	49.72	9.086		2	21	45.1	58.75	16	3.32	64.44	5	39.96	0.768
Mon.	28	0	25	27.78	9.086		2	45	13.5	+58.62	16	3.05	64.44	5	21.52	0.768
Tues.	29	0	29	5.86	9.088		3	8	38.7	58.47	16	2.77	64.44	5	3.09	0.766
Wed.	30	0	32	43.98	9.090		3	32	0.3	58.31	16	2.49	64.45	4	44.70	0.764
Thur.	31	0	36	22.17	9.093		3	55	18.0	58.14	16	2.20	64.46	4	26.39	0.761
Frid.	32	0	40	0.46	9.098	N.	4	18	31.4	+57.96	16	1.92	64.47	4	8.17	0.757

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0<sup>s</sup>.18 from the sidereal time.  
The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing, and north declinations are increasing.



## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Tues.	1	22 46 16.16	9.375	S. 7 48 38.0	+56.80	12 37.69	0.481	22 33 38.47
Wed.	2	22 50 0.93	9.355	7 25 51.3	57.08	12 25.91	0.501	22 37 35.02
Thur.	3	22 53 45.21	9.335	7 2 58.1	57.34	12 13.64	0.522	22 41 31.57
Frid.	4	22 57 29.02	9.316	6 39 58.9	+57.59	12 0.90	0.542	22 45 28.13
Sat.	5	23 1 12.39	9.298	6 16 54.0	57.82	11 47.71	0.560	22 49 24.68
SUN.	6	23 4 55.33	9.281	5 53 43.8	58.03	11 34.09	0.576	22 53 21.23
Mon.	7	23 8 37.86	9.264	5 30 28.6	+58.23	11 20.07	0.593	22 57 17.79
Tues.	8	23 12 19.99	9.248	5 7 8.9	58.41	11 5.65	0.609	23 1 14.34
Wed.	9	23 16 1.75	9.232	4 43 45.0	58.57	10 50.86	0.624	23 5 10.90
Thur.	10	23 19 43.16	9.218	4 20 17.4	+58.72	10 35.71	0.638	23 9 7.45
Frid.	11	23 23 24.22	9.204	3 56 46.5	58.85	10 20.22	0.652	23 13 4.00
Sat.	12	23 27 4.95	9.191	3 33 12.6	58.96	10 4.39	0.664	23 17 0.56
SUN.	13	23 30 45.37	9.178	3 9 36.2	+59.05	9 48.25	0.676	23 20 57.11
Mon.	14	23 34 25.49	9.166	2 45 57.8	59.14	9 31.82	0.687	23 24 53.66
Tues.	15	23 38 5.33	9.155	2 22 17.7	59.20	9 15.11	0.699	23 28 50.22
Wed.	16	23 41 44.90	9.144	1 58 36.2	+59.25	8 58.13	0.710	23 32 46.77
Thur.	17	23 45 24.22	9.134	1 34 53.9	59.28	8 40.90	0.720	23 36 43.32
Frid.	18	23 49 3.33	9.125	1 11 11.0	59.29	8 23.45	0.730	23 40 39.88
Sat.	19	23 52 42.24	9.117	0 47 28.0	+59.29	8 5.81	0.739	23 44 36.43
SUN.	20	23 56 20.96	9.110	0 23 45.2	59.27	7 47.98	0.747	23 48 32.98
Mon.	21	23 59 59.52	9.104	S. 0 0 2.9	59.24	7 29.99	0.753	23 52 29.53
Tues.	22	0 3 37.95	9.099	N. 0 23 38.4	+59.19	7 11.86	0.758	23 56 26.09
Wed.	23	0 7 16.27	9.095	0 47 18.4	59.13	6 53.62	0.762	0 0 22.64
Thur.	24	0 10 54.50	9.092	1 10 56.9	59.06	6 35.30	0.765	0 4 19.19
Frid.	25	0 14 32.66	9.090	1 34 33.5	+58.97	6 16.91	0.767	0 8 15.75
Sat.	26	0 18 10.77	9.089	1 58 7.8	58.87	5 58.47	0.768	0 12 12.30
SUN.	27	0 21 48.86	9.088	2 21 39.5	58.75	5 40.01	0.768	0 16 8.85
Mon.	28	0 25 26.96	9.088	2 45 8.3	+58.63	5 21.55	0.768	0 20 5.41
Tues.	29	0 29 5.09	9.090	3 8 33.8	58.49	5 3.12	0.766	0 24 1.96
Wed.	30	0 32 43.25	9.092	3 31 55.7	58.33	4 44.74	0.764	0 27 58.51
Thur.	31	0 36 21.49	9.095	3 55 13.7	58.16	4 26.43	0.761	0 31 55.07
Frid.	32	0 39 59.83	9.100	N. 4 18 27.4	+57.97	4 8.21	0.757	0 35 51.62

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
 The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing, and north declinations increasing.

Diff. for 1 Hour,  
 +9'.8565.  
 (Table III.)

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
		° ' "	' "	"	"				h m s
1	60	340 2 22.7	2 28.7	150.47	— 0.13	9.996 1093	+ 45.8		1 26 7.38
2	61	341 2 33.1	2 39.0	150.41	0.26	9.996 2199	46.3		1 22 11.48
3	62	342 2 41.9	2 47.7	150.34	0.39	9.996 3317	46.8		1 18 15.57
4	63	343 2 49.2	2 54.9	150.27	— 0.51	9.996 4447	+ 47.3		1 14 19.66
5	64	344 2 54.9	3 0.5	150.20	0.62	9.996 5588	47.7		1 10 23.75
6	65	345 2 59.1	3 4.5	150.14	0.72	9.996 6737	48.0		1 6 27.85
7	66	346 3 1.6	3 7.0	150.07	— 0.81	9.996 7893	+ 48.3		1 2 31.94
8	67	347 3 2.5	3 7.8	150.00	0.87	9.996 9054	48.5		0 58 36.03
9	68	348 3 1.7	3 6.9	149.93	0.90	9.997 0219	48.6		0 54 40.12
10	69	349 2 59.1	3 4.2	149.86	— 0.90	9.997 1386	+ 48.7		0 50 44.21
11	70	350 2 54.7	2 59.7	149.78	0.87	9.997 2555	48.8		0 46 48.31
12	71	351 2 48.4	2 53.2	149.69	0.83	9.997 3725	48.8		0 42 52.40
13	72	352 2 40.0	2 44.7	149.61	— 0.73	9.997 4895	+ 48.8		0 38 56.49
14	73	353 2 29.5	2 34.1	149.52	0.61	9.997 6067	48.8		0 35 0.58
15	74	354 2 16.8	2 21.3	149.42	0.48	9.997 7239	48.9		0 31 4.68
16	75	355 2 1.8	2 6.3	149.33	— 0.34	9.997 8414	+ 49.0		0 27 8.77
17	76	356 1 44.6	1 48.9	149.23	0.21	9.997 9593	49.2		0 23 12.86
18	77	357 1 25.1	1 29.3	149.14	— 0.08	9.998 0777	49.4		0 19 16.95
19	78	358 1 3.3	1 7.4	149.04	+ 0.02	9.998 1965	+ 49.7		0 15 21.05
20	79	359 0 39.2	0 43.2	148.95	0.11	9.998 3160	50.0		0 11 25.14
21	80	0 0 12.8	0 16.7	148.85	0.17	9.998 4363	50.3		0 7 29.23
22	81	0 59 44.1	59 48.0	148.76	+ 0.19	9.998 5573	+ 50.6	{ 0 59 44.1 23 55 41.51 23 51 45.60 }	
23	82	1 59 13.3	59 17.1	148.67	0.20	9.998 6792	50.9	23 55 41.51	
24	83	2 58 40.4	58 44.0	148.58	0.18	9.998 8019	51.3	23 51 45.60	
25	84	3 58 5.3	58 8.8	148.50	+ 0.12	9.998 9254	+ 51.6	23 47 49.69	
26	85	4 57 28.2	57 31.6	148.41	+ 0.05	9.999 0497	51.9	23 43 53.79	
27	86	5 56 49.1	56 52.4	148.33	— 0.03	9.999 1747	52.2	23 39 57.88	
28	87	6 56 8.0	56 11.2	148.25	— 0.15	9.999 3004	+ 52.5	23 36 1.97	
29	88	7 55 25.0	55 28.1	148.17	0.27	9.999 4267	52.7	23 32 6.07	
30	89	8 54 40.1	54 43.1	148.09	0.40	9.999 5535	52.9	23 28 10.16	
31	90	9 53 53.4	53 56.3	148.02	0.53	9.999 6807	53.1	23 24 14.25	
32	91	10 53 4.8	53 7.6	147.95	— 0.64	9.999 8082	+ 53.1	23 20 18.34	

NOTE.—The numbers in column  $\lambda$  correspond to the true equinox of the date; in column  $\lambda'$  to the mean equinox of January 0<sup>d</sup>.0.

Diff. for 1 Hour,  
— 0<sup>s</sup>.8296.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	' "	' "	' "	"	' "	"	h m	m	d
1	14 46.6	14 47.6	54 8.2	+ 0.21	54 11.8	+ 0.41	16 24.4	1.80	19.4
2	14 49.3	14 51.6	54 17.9	0.61	54 26.5	0.82	17 8.9	1.91	20.4
3	14 54.6	14 58.3	54 37.5	1.03	54 51.1	1.24	17 56.5	2.05	21.4
4	15 2.7	15 7.8	55 7.2	+ 1.44	55 25.7	+ 1.63	18 47.5	2.19	22.4
5	15 13.4	15 19.6	55 46.4	1.81	56 9.2	1.95	19 41.5	2.30	23.4
6	15 26.3	15 33.4	56 33.7	2.10	56 59.7	2.21	20 37.5	2.37	24.4
7	15 40.8	15 48.3	57 26.7	+ 2.28	57 54.4	+ 2.30	21 34.2	2.37	25.4
8	15 55.8	16 3.1	58 21.9	2.27	58 48.8	2.19	22 30.4	2.31	26.4
9	16 10.1	16 16.6	59 14.4	2.05	59 38.1	1.87	23 25.2	2.25	27.4
10	16 22.3	16 27.3	59 59.3	+ 1.63	60 17.4	+ 1.35	.	.	28.4
11	16 31.3	16 34.1	60 31.8	1.04	60 42.3	+ 0.69	0 18.1	2.18	29.4
12	16 35.7	16 36.2	60 48.5	+ 0.34	60 50.3	- 0.02	1 10.0	2.15	1.0
13	16 35.6	16 33.8	60 47.9	- 0.38	60 41.4	- 0.69	2 1.8	2.17	2.0
14	16 31.0	16 27.4	60 31.3	0.98	60 17.9	1.23	2 54.3	2.23	3.0
15	16 23.0	16 18.0	60 1.7	1.44	59 43.3	1 60	3 48.6	2.30	4.0
16	16 12.5	16 6.7	59 23.2	- 1.72	59 2.1	- 1.79	4 44.8	2.39	5.0
17	16 0.8	15 54.8	58 40.2	1.83	58 18.2	1.83	5 42.7	2.43	6.0
18	15 48.8	15 43.0	57 56.3	1.81	57 34.8	1.76	6 41.2	2.42	7.0
19	15 37.4	15 31.9	57 14.0	- 1.70	56 54.1	- 1.62	7 38.5	2.34	8.0
20	15 26.7	15 21.8	56 35.2	1.53	56 17.3	1.44	8 33.2	2.21	9.0
21	15 17.2	15 13.0	56 0.5	1.35	55 44.8	1.26	9 24.5	2.05	10.0
22	15 9.0	15 5.3	55 30.2	- 1.17	55 16.7	- 1.08	10 12.1	1.91	11.0
23	15 1.9	14 58.8	55 4.2	0.99	54 52.8	0.90	10 56.6	1.80	12.0
24	14 56.0	14 53.4	54 42.4	0.82	54 33.1	0.73	11 38.7	1.71	13.0
25	14 51.1	14 49.2	54 24.9	- 0.64	54 17.7	- 0.54	12 19.3	1.67	14.0
26	14 47.6	14 46.3	54 11.7	0.45	54 6.8	0.35	12 59.3	1.67	15.0
27	14 45.3	14 44.8	54 3.3	- 0.24	54 1.2	- 0.12	13 39.6	1.70	16.0
28	14 44.6	14 44.8	54 0.5	+ 0.01	54 1.4	+ 0.15	14 21.2	1.77	17.0
29	14 45.5	14 46.8	54 4.1	0.30	54 8.6	0.46	15 4.7	1.86	18.0
30	14 48.5	14 50.8	54 15.1	0.63	54 23.6	0.80	15 50.8	1.98	19.0
31	14 53.8	14 57.3	54 34.3	0.98	54 47.2	1.17	16 39.9	2.11	20.0
32	15 1.4	15 6.2	55 2.4	+ 1.36	55 19.9	+ 1.55	17 31.8	2.21	21.0

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 1.					THURSDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	14 29 47.41	1.8584	S. 12 44 4.9	11.589	0	16 3 18.32	2.0555	S. 20 51 8.0	8.393
1	14 31 39.00	1.8613	12 55 38.8	11.541	1	16 5 21.80	2.0605	20 59 29.0	8.306
2	14 33 30.77	1.8643	13 7 9.8	11.492	2	16 7 25.58	2.0656	21 7 44.7	8.217
3	14 35 22.72	1.8673	13 18 37.8	11.442	3	16 9 29.67	2.0708	21 15 55.0	8.128
4	14 37 14.85	1.8704	13 30 2.8	11.392	4	16 11 34.07	2.0759	21 24 0.0	8.038
5	14 39 7.17	1.8737	13 41 24.8	11.341	5	16 13 38.78	2.0810	21 31 59.6	7.948
6	14 40 59.69	1.8769	13 52 43.7	11.289	6	16 15 43.79	2.0862	21 39 53.7	7.855
7	14 42 52.40	1.8802	14 3 59.5	11.237	7	16 17 49.12	2.0914	21 47 42.2	7.762
8	14 44 45.31	1.8835	14 15 12.1	11.183	8	16 19 54.76	2.0966	21 55 25.1	7.668
9	14 46 38.42	1.8868	14 26 21.4	11.128	9	16 22 0.71	2.1018	22 3 2.4	7.574
10	14 48 31.73	1.8903	14 37 27.5	11.073	10	16 24 6.98	2.1071	22 10 34.0	7.478
11	14 50 25.25	1.8938	14 48 30.2	11.018	11	16 26 13.56	2.1123	22 17 59.8	7.381
12	14 52 18.99	1.8973	14 59 29.6	10.962	12	16 28 20.46	2.1176	22 25 19.7	7.283
13	14 54 12.94	1.9009	15 10 25.6	10.904	13	16 30 27.67	2.1228	22 32 33.8	7.185
14	14 56 7.10	1.9046	15 21 18.1	10.846	14	16 32 35.20	2.1282	22 39 41.9	7.085
15	14 58 1.49	1.9083	15 32 7.1	10.788	15	16 34 43.05	2.1334	22 46 44.0	6.985
16	14 59 56.10	1.9121	15 42 52.6	10.728	16	16 36 51.21	2.1387	22 53 40.1	6.884
17	15 1 50.94	1.9158	15 53 34.5	10.668	17	16 38 59.69	2.1440	23 0 30.1	6.782
18	15 3 46.00	1.9197	16 4 12.8	10.608	18	16 41 8.49	2.1493	23 7 13.9	6.678
19	15 5 41.30	1.9236	16 14 47.4	10.546	19	16 43 17.61	2.1547	23 13 51.5	6.574
20	15 7 36.84	1.9276	16 25 18.3	10.483	20	16 45 27.05	2.1600	23 20 22.8	6.469
21	15 9 32.61	1.9316	16 35 45.4	10.420	21	16 47 36.81	2.1653	23 26 47.8	6.363
22	15 11 28.62	1.9356	16 46 8.7	10.355	22	16 49 46.88	2.1706	23 33 6.3	6.255
23	15 13 24.88	1.9397	S. 16 56 28.0	10.290	23	16 51 57.27	2.1758	S. 23 39 18.4	6.147
WEDNESDAY 2.					FRIDAY 4.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	15 15 21.38	1.9438	S. 17 6 43.5	10.225	0	16 54 7.98	2.1812	S. 23 45 24.0	6.038
1	15 17 18.14	1.9481	17 16 55.0	10.158	1	16 56 19.01	2.1864	23 51 23.0	5.928
2	15 19 15.15	1.9523	17 27 2.5	10.091	2	16 58 30.35	2.1917	23 57 15.4	5.818
3	15 21 12.41	1.9565	17 37 5.9	10.023	3	17 0 42.01	2.1969	24 3 1.1	5.705
4	15 23 9.93	1.9608	17 47 5.2	9.953	4	17 2 53.98	2.2022	24 8 40.0	5.593
5	15 25 7.71	1.9653	17 57 0.3	9.883	5	17 5 6.27	2.2074	24 14 12.2	5.479
6	15 27 5.76	1.9697	18 6 51.2	9.813	6	17 7 18.87	2.2127	24 19 37.5	5.363
7	15 29 4.07	1.9741	18 16 37.8	9.741	7	17 9 31.79	2.2179	24 24 55.8	5.248
8	15 31 2.65	1.9787	18 26 20.1	9.669	8	17 11 45.02	2.2230	24 30 7.2	5.132
9	15 33 1.50	1.9832	18 35 58.1	9.596	9	17 13 58.56	2.2282	24 35 11.6	5.014
10	15 35 0.63	1.9877	18 45 31.6	9.522	10	17 16 12.40	2.2333	24 40 8.9	4.895
11	15 37 0.03	1.9923	18 55 0.7	9.447	11	17 18 26.55	2.2384	24 44 59.0	4.775
12	15 38 59.71	1.9970	19 4 25.2	9.371	12	17 20 41.01	2.2435	24 49 41.9	4.655
13	15 40 59.67	2.0017	19 13 45.2	9.294	13	17 22 55.77	2.2486	24 54 17.6	4.534
14	15 42 59.91	2.0064	19 23 0.5	9.217	14	17 25 10.84	2.2536	24 58 46.0	4.412
15	15 45 0.44	2.0112	19 32 11.2	9.138	15	17 27 26.21	2.2586	25 3 7.0	4.288
16	15 47 1.25	2.0159	19 41 17.1	9.059	16	17 29 41.87	2.2636	25 7 20.6	4.164
17	15 49 2.35	2.0208	19 50 18.3	8.979	17	17 31 57.83	2.2684	25 11 26.7	4.039
18	15 51 3.74	2.0257	19 59 14.6	8.898	18	17 34 14.08	2.2733	25 15 25.3	3.913
19	15 53 5.43	2.0306	20 8 6.0	8.816	19	17 36 30.63	2.2782	25 19 16.3	3.787
20	15 55 7.41	2.0355	20 16 52.5	8.733	20	17 38 47.46	2.2829	25 22 59.7	3.658
21	15 57 9.69	2.0405	20 25 34.0	8.649	21	17 41 4.58	2.2878	25 26 35.3	3.529
22	15 59 12.27	2.0454	20 34 10.4	8.565	22	17 43 21.99	2.2925	25 30 3.2	3.400
23	16 1 15.14	2.0504	20 42 41.8	8.480	23	17 45 39.68	2.2972	25 33 23.3	3.270
24	16 3 18.32	2.0555	S. 20 51 8.0	8.393	24	17 47 57.65	2.3018	S. 25 36 35.6	3.139

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.	Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.			Diff. for 1 Minute.
SATURDAY 5.									MONDAY 7.								
0	h	m	s	s	°	'	"	"	0	h	m	s	s	°	'	"	"
0	17	47	57.65	2.3018	S. 25	36	35.6	3.139	0	19	42	30.00	2.4393	S. 25	22	15.0	3.940
1	17	50	15.89	2.3063	25	39	40.0	3.007	1	19	44	56.38	2.4400	25	18	13.9	4.098
2	17	52	34.41	2.3109	25	42	36.4	2.873	2	19	47	22.80	2.4407	25	14	3.3	4.254
3	17	54	53.20	2.3153	25	45	24.8	2.740	3	19	49	49.26	2.4413	25	9	43.4	4.410
4	17	57	12.25	2.3198	25	48	5.2	2.605	4	19	52	15.75	2.4417	25	5	14.1	4.567
5	17	59	31.57	2.3242	25	50	37.4	2.469	5	19	54	42.26	2.4420	25	0	35.4	4.723
6	18	1	51.15	2.3284	25	53	1.5	2.333	6	19	57	8.79	2.4422	24	55	47.3	4.880
7	18	4	10.98	2.3327	25	55	17.4	2.196	7	19	59	35.33	2.4423	24	50	49.8	5.037
8	18	6	31.07	2.3368	25	57	25.0	2.058	8	20	2	1.87	2.4424	24	45	42.9	5.193
9	18	8	51.40	2.3409	25	59	24.3	1.919	9	20	4	28.42	2.4424	24	40	26.7	5.348
10	18	11	11.98	2.3450	26	1	15.3	1.780	10	20	6	54.96	2.4423	24	35	1.1	5.504
11	18	13	32.80	2.3490	26	2	57.9	1.639	11	20	9	21.50	2.4422	24	29	26.2	5.659
12	18	15	53.86	2.3529	26	4	32.0	1.498	12	20	11	48.02	2.4418	24	23	42.0	5.815
13	18	18	15.15	2.3568	26	5	57.7	1.357	13	20	14	14.52	2.4415	24	17	48.4	5.971
14	18	20	36.67	2.3606	26	7	14.8	1.214	14	20	16	41.00	2.4411	24	11	45.5	6.125
15	18	22	58.42	2.3643	26	8	23.4	1.071	15	20	19	7.45	2.4405	24	5	33.4	6.278
16	18	25	20.39	2.3679	26	9	23.3	0.927	16	20	21	33.86	2.4399	23	59	12.1	6.433
17	18	27	42.57	2.3715	26	10	14.6	0.783	17	20	24	0.24	2.4393	23	52	41.4	6.588
18	18	30	4.97	2.3750	26	10	57.2	0.638	18	20	26	26.57	2.4384	23	46	1.5	6.742
19	18	32	27.57	2.3783	26	11	31.1	0.492	19	20	28	52.85	2.4376	23	39	12.4	6.894
20	18	34	50.37	2.3817	26	11	56.2	0.345	20	20	31	19.08	2.4367	23	32	14.2	7.047
21	18	37	13.37	2.3850	26	12	12.5	0.198	21	20	33	45.25	2.4357	23	25	6.8	7.199
22	18	39	36.57	2.3882	26	12	20.0	-0.051	22	20	36	11.36	2.4346	23	17	50.3	7.350
23	18	41	59.95	2.3912	S. 26	12	18.6	+0.098	23	20	38	37.40	2.4334	S. 23	10	24.8	7.501
SUNDAY 6.									TUESDAY 8.								
0	18	44	23.51	2.3942	S. 26	12	8.2	0.248	0	20	41	3.37	2.4322	S. 23	2	50.2	7.652
1	18	46	47.25	2.3971	26	11	48.9	0.397	1	20	43	29.26	2.4309	22	55	6.6	7.802
2	18	49	11.16	2.3999	26	11	20.6	0.547	2	20	45	55.08	2.4296	22	47	14.0	7.952
3	18	51	35.24	2.4027	26	10	43.3	0.697	3	20	48	20.81	2.4281	22	39	12.4	8.101
4	18	53	59.48	2.4053	26	9	57.0	0.848	4	20	50	46.45	2.4266	22	31	1.9	8.248
5	18	56	23.87	2.4078	26	9	1.6	0.999	5	20	53	12.00	2.4250	22	22	42.6	8.396
6	18	58	48.42	2.4104	26	7	57.1	1.151	6	20	55	37.45	2.4234	22	14	14.4	8.543
7	19	1	13.12	2.4128	26	6	43.5	1.303	7	20	58	2.81	2.4218	22	5	37.4	8.689
8	19	3	37.96	2.4151	26	5	20.7	1.457	8	21	0	28.06	2.4200	21	56	51.7	8.834
9	19	6	2.93	2.4173	26	3	48.7	1.610	9	21	2	53.21	2.4182	21	47	57.3	8.979
10	19	8	28.03	2.4193	26	2	7.5	1.763	10	21	5	18.25	2.4163	21	38	54.2	9.123
11	19	10	53.25	2.4214	26	0	17.1	1.917	11	21	7	43.17	2.4144	21	29	42.5	9.267
12	19	13	18.60	2.4234	25	58	17.5	2.071	12	21	10	7.98	2.4125	21	20	22.2	9.409
13	19	15	44.06	2.4253	25	56	8.6	2.226	13	21	12	32.67	2.4104	21	10	53.4	9.550
14	19	18	9.63	2.4270	25	53	50.4	2.381	14	21	14	57.23	2.4083	21	1	16.2	9.690
15	19	20	35.30	2.4286	25	51	22.9	2.536	15	21	17	21.67	2.4063	20	51	30.6	9.830
16	19	23	1.06	2.4302	25	48	46.1	2.691	16	21	19	45.99	2.4042	20	41	36.6	9.969
17	19	25	26.92	2.4318	25	46	0.0	2.847	17	21	22	10.17	2.4019	20	31	34.3	10.108
18	19	27	52.87	2.4331	25	43	4.5	3.003	18	21	24	34.22	2.3997	20	21	23.7	10.244
19	19	30	18.89	2.4343	25	39	59.7	3.158	19	21	26	58.13	2.3974	20	11	5.0	10.379
20	19	32	44.99	2.4355	25	36	45.5	3.315	20	21	29	21.91	2.3951	20	0	38.2	10.514
21	19	35	11.15	2.4366	25	33	21.9	3.471	21	21	31	45.54	2.3927	19	50	3.3	10.648
22	19	37	37.38	2.4376	25	29	49.0	3.627	22	21	34	9.03	2.3903	19	39	20.4	10.781
23	19	40	3.66	2.4385	25	26	6.7	3.783	23	21	36	32.38	2.3880	19	28	29.6	10.913
24	19	42	30.00	2.4393	S. 25	22	15.0	3.940	24	21	38	55.59	2.3856	S. 19	17	30.9	11.043

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 9.					FRIDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 38 55.59	2.3856	S. 19 17 30.9	11.043	0	23 30 31.01	2.2700	S. 8 22 5.7	15.684
1	21 41 18.65	2.3830	19 6 24.4	11.173	1	23 32 47.16	2.2683	8 6 22.9	15.742
2	21 43 41.55	2.3805	18 55 10.2	11.301	2	23 35 3.20	2.2666	7 50 36.7	15.797
3	21 46 4.31	2.3781	18 43 48.3	11.428	3	23 37 19.14	2.2648	7 34 47.3	15.850
4	21 48 26.92	2.3755	18 32 18.8	11.554	4	23 39 34.98	2.2633	7 18 54.7	15.902
5	21 50 49.37	2.3729	18 20 41.8	11.679	5	23 41 50.73	2.2618	7 2 59.1	15.952
6	21 53 11.67	2.3704	18 8 57.3	11.803	6	23 44 6.39	2.2603	6 47 0.5	16.000
7	21 55 33.82	2.3678	17 57 5.4	11.925	7	23 46 21.97	2.2588	6 30 59.1	16.046
8	21 57 55.81	2.3652	17 45 6.2	12.046	8	23 48 37.46	2.2575	6 14 55.0	16.091
9	22 0 17.64	2.3626	17 32 59.8	12.166	9	23 50 52.87	2.2562	5 58 48.2	16.134
10	22 2 39.32	2.3600	17 20 46.3	12.285	10	23 53 8.20	2.2549	5 42 38.9	16.174
11	22 5 0.84	2.3573	17 8 25.7	12.403	11	23 55 23.46	2.2537	5 26 27.3	16.213
12	22 7 22.20	2.3547	16 55 58.1	12.518	12	23 57 38.65	2.2526	5 10 13.4	16.250
13	22 9 43.40	2.3520	16 43 23.6	12.633	13	23 59 53.77	2.2515	4 53 57.3	16.285
14	22 12 4.44	2.3494	16 30 42.2	12.747	14	0 2 8.83	2.2505	4 37 39.2	16.318
15	22 14 25.33	2.3468	16 17 54.0	12.858	15	0 4 23.83	2.2495	4 21 19.1	16.350
16	22 16 46.06	2.3442	16 4 59.2	12.968	16	0 6 38.77	2.2486	4 4 57.2	16.380
17	22 19 6.63	2.3415	15 51 57.8	13.078	17	0 8 53.66	2.2478	3 48 33.5	16.408
18	22 21 27.04	2.3388	15 38 49.9	13.185	18	0 11 8.50	2.2470	3 32 8.2	16.433
19	22 23 47.29	2.3363	15 25 35.6	13.291	19	0 13 23.30	2.2463	3 15 41.5	16.457
20	22 26 7.39	2.3337	15 12 15.0	13.396	20	0 15 38.06	2.2456	2 59 13.4	16.479
21	22 28 27.33	2.3310	14 58 48.1	13.500	21	0 17 52.78	2.2449	2 42 44.0	16.500
22	22 30 47.11	2.3284	14 45 15.0	13.602	22	0 20 7.46	2.2445	2 26 13.4	16.513
23	22 33 6.74	2.3258	S. 14 31 35.9	13.702	23	0 22 22.11	2.2440	S. 2 9 41.8	16.535
THURSDAY 10.					SATURDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	22 35 26.21	2.3233	S. 14 17 50.8	13.801	0	0 24 36.73	2.2435	S. 1 53 9.2	16.550
1	22 37 45.53	2.3208	14 3 59.8	13.898	1	0 26 51.33	2.2432	1 36 35.8	16.563
2	22 40 4.70	2.3182	13 50 3.1	13.993	2	0 29 5.91	2.2429	1 20 1.7	16.573
3	22 42 23.71	2.3157	13 36 0.7	14.088	3	0 31 20.48	2.2427	1 3 27.0	16.582
4	22 44 42.58	2.3133	13 21 52.6	14.181	4	0 33 35.03	2.2425	0 46 51.9	16.588
5	22 47 1.30	2.3108	13 7 39.0	14.272	5	0 35 49.58	2.2425	0 30 16.4	16.594
6	22 49 19.87	2.3083	12 53 20.0	14.361	6	0 38 4.13	2.2424	S. 0 13 40.6	16.598
7	22 51 38.29	2.3058	12 38 55.7	14.448	7	0 40 18.67	2.2424	N. 0 2 55.4	16.600
8	22 53 56.57	2.3035	12 24 26.2	14.534	8	0 42 33.22	2.2425	0 19 31.4	16.599
9	22 56 14.71	2.3011	12 9 51.6	14.619	9	0 44 47.77	2.2427	0 36 7.3	16.597
10	22 58 32.70	2.2988	11 55 11.9	14.702	10	0 47 2.34	2.2429	0 52 43.0	16.593
11	23 0 50.56	2.2965	11 40 27.3	14.783	11	0 49 16.92	2.2432	1 9 18.4	16.587
12	23 3 8.28	2.2942	11 25 37.9	14.863	12	0 51 31.52	2.2436	1 25 53.4	16.578
13	23 5 25.86	2.2919	11 10 43.8	14.941	13	0 53 46.15	2.2440	1 42 27.8	16.568
14	23 7 43.31	2.2898	10 55 45.0	15.018	14	0 56 0.80	2.2444	1 59 1.6	16.557
15	23 10 0.63	2.2876	10 40 41.7	15.092	15	0 58 15.48	2.2450	2 15 34.7	16.544
16	23 12 17.82	2.2855	10 25 34.0	15.164	16	1 0 30.20	2.2457	2 32 6.9	16.528
17	23 14 34.89	2.2834	10 10 22.0	15.235	17	1 2 44.96	2.2463	2 48 38.1	16.511
18	23 16 51.83	2.2813	9 55 5.8	15.305	18	1 4 59.76	2.2471	3 5 8.2	16.492
19	23 19 8.65	2.2793	9 39 45.5	15.373	19	1 7 14.61	2.2479	3 21 37.1	16.471
20	23 21 25.35	2.2773	9 24 21.1	15.438	20	1 9 29.51	2.2488	3 38 4.7	16.448
21	23 23 41.93	2.2754	9 8 52.8	15.503	21	1 11 44.46	2.2497	3 54 30.9	16.423
22	23 25 58.40	2.2736	8 53 20.7	15.565	22	1 13 59.47	2.2507	4 10 55.5	16.397
23	23 28 14.76	2.2718	8 37 45.0	15.626	23	1 16 14.55	2.2518	4 27 18.5	16.368
24	23 30 31.01	2.2700	S. 8 22 5.7	15.684	24	1 18 29.69	2.2529	N. 4 43 39.7	16.338

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 13.					TUESDAY 15.				
0	1 18 29.69	2.2529	N. 4 43 39.7	16.338	0	3 8 59.73	2.3681	N. 16 39 9.0	12.827
1	1 20 44.90	2.2542	4 59 59.0	16.305	1	3 11 21.91	2.3713	16 51 55.2	12.714
2	1 23 0.19	2.2554	5 16 16.3	16.272	2	3 13 44.29	2.3746	17 4 34.7	12.601
3	1 25 15.55	2.2567	5 32 31.6	16.236	3	3 16 6.86	2.3778	17 17 7.3	12.485
4	1 27 30.99	2.2581	5 48 44.6	16.198	4	3 18 29.62	2.3810	17 29 32.9	12.368
5	1 29 46.52	2.2596	6 4 55.3	16.158	5	3 20 52.58	2.3843	17 41 51.5	12.251
6	1 32 2.14	2.2611	6 21 3.6	16.117	6	3 23 15.73	2.3875	17 54 3.0	12.131
7	1 34 17.85	2.2626	6 37 9.4	16.074	7	3 25 39.08	2.3908	18 6 7.2	12.010
8	1 36 33.65	2.2643	6 53 12.5	16.029	8	3 28 2.62	2.3940	18 18 4.2	11.888
9	1 38 49.56	2.2660	7 9 12.9	15.982	9	3 30 26.36	2.3973	18 29 53.8	11.765
10	1 41 5.57	2.2678	7 25 10.4	15.933	10	3 32 50.29	2.4004	18 41 36.0	11.640
11	1 43 21.69	2.2695	7 41 4.9	15.883	11	3 35 14.41	2.4036	18 53 10.6	11.514
12	1 45 37.91	2.2713	7 56 56.4	15.832	12	3 37 38.72	2.4068	19 4 37.7	11.388
13	1 47 54.25	2.2733	8 12 44.7	15.778	13	3 40 3.23	2.4101	19 15 57.1	11.259
14	1 50 10.70	2.2753	8 28 29.7	15.722	14	3 42 27.93	2.4133	19 27 8.8	11.129
15	1 52 27.28	2.2773	8 44 11.3	15.664	15	3 44 52.82	2.4164	19 38 12.6	10.998
16	1 54 43.98	2.2793	8 59 49.4	15.605	16	3 47 17.90	2.4195	19 49 8.5	10.866
17	1 57 0.80	2.2814	9 15 23.9	15.544	17	3 49 43.16	2.4226	19 59 56.5	10.733
18	1 59 17.75	2.2837	9 30 54.7	15.481	18	3 52 8.61	2.4258	20 10 36.4	10.598
19	2 1 34.84	2.2859	9 46 21.6	15.416	19	3 54 34.25	2.4288	20 21 8.2	10.463
20	2 3 52.06	2.2882	10 1 44.6	15.350	20	3 57 0.07	2.4318	20 31 31.9	10.326
21	2 6 9.42	2.2905	10 17 3.6	15.282	21	3 59 26.07	2.4348	20 41 47.3	10.188
22	2 8 26.92	2.2929	10 32 18.5	15.213	22	4 1 52.25	2.4378	20 51 54.5	10.050
23	2 10 44.57	2.2953	N. 10 47 29.1	15.141	23	4 4 18.61	2.4408	N. 21 1 53.3	9.910
MONDAY 14.					WEDNESDAY 16.				
0	2 13 2.36	2.2978	N. 11 2 35.4	15.068	0	4 6 45.14	2.4437	N. 21 11 43.7	9.768
1	2 15 20.30	2.3003	11 17 37.3	14.993	1	4 9 11.85	2.4466	21 21 25.5	9.626
2	2 17 38.40	2.3029	11 32 34.6	14.917	2	4 11 38.73	2.4493	21 30 58.8	9.483
3	2 19 56.65	2.3055	11 47 27.3	14.838	3	4 14 5.77	2.4521	21 40 23.5	9.339
4	2 22 15.06	2.3082	12 2 15.2	14.758	4	4 16 32.98	2.4549	21 49 39.5	9.194
5	2 24 33.63	2.3108	12 16 58.3	14.678	5	4 19 0.36	2.4577	21 58 46.8	9.048
6	2 26 52.36	2.3136	12 31 36.5	14.594	6	4 21 27.90	2.4603	22 7 45.3	8.901
7	2 29 11.26	2.3163	12 46 9.6	14.509	7	4 23 55.59	2.4628	22 16 34.9	8.753
8	2 31 30.32	2.3192	13 0 37.6	14.423	8	4 26 23.43	2.4653	22 25 15.7	8.605
9	2 33 49.56	2.3221	13 15 0.3	14.334	9	4 28 51.43	2.4678	22 33 47.5	8.455
10	2 36 8.97	2.3249	13 29 17.7	14.245	10	4 31 19.58	2.4703	22 42 10.3	8.304
11	2 38 28.55	2.3278	13 43 29.7	14.154	11	4 33 47.87	2.4727	22 50 24.0	8.153
12	2 40 48.31	2.3308	13 57 36.2	14.062	12	4 36 16.30	2.4750	22 58 28.7	8.002
13	2 43 8.25	2.3338	14 11 37.1	13.967	13	4 38 44.87	2.4773	23 6 24.2	7.848
14	2 45 28.36	2.3368	14 25 32.2	13.870	14	4 41 13.57	2.4794	23 14 10.5	7.695
15	2 47 48.66	2.3398	14 39 21.5	13.773	15	4 43 42.40	2.4816	23 21 47.6	7.541
16	2 50 9.14	2.3429	14 53 5.0	13.674	16	4 46 11.36	2.4836	23 29 15.4	7.386
17	2 52 29.81	2.3460	15 6 42.4	13.573	17	4 48 40.43	2.4855	23 36 33.9	7.230
18	2 54 50.66	2.3491	15 20 13.7	13.471	18	4 51 9.62	2.4874	23 43 43.0	7.074
19	2 57 11.70	2.3522	15 33 38.9	13.368	19	4 53 38.92	2.4893	23 50 42.8	6.917
20	2 59 32.92	2.3553	15 46 57.8	13.262	20	4 56 8.33	2.4910	23 57 33.1	6.759
21	3 1 54.33	2.3585	16 0 10.3	13.155	21	4 58 37.84	2.4927	24 4 13.9	6.602
22	3 4 15.94	2.3617	16 13 16.4	13.048	22	5 1 7.45	2.4943	24 10 45.3	6.443
23	3 6 37.74	2.3649	16 26 16.0	12.938	23	5 3 37.15	2.4958	24 17 7.1	6.283
24	3 8 59.73	2.3681	N. 16 39 9.0	12.827	24	5 6 6.94	2.4972	N. 24 23 19.3	6.123

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 17.					SATURDAY 19.				
0	h m s	s	N. 24 23 19.3	"	0	h m s	s	N. 26 9 48.7	"
1	5 6 6.94	2.4972	24 23 19.3	6.123	1	7 5 45.67	2.4483	26 8 5.9	1.636
2	5 8 36.81	2.4985	24 29 21.9	5.963	2	7 8 12.47	2.4448	26 6 14.0	1.799
3	5 11 6.76	2.4998	24 35 14.9	5.803	3	7 10 39.05	2.4413	26 4 12.9	1.942
4	5 13 36.78	2.5009	24 40 58.2	5.642	4	7 13 5.42	2.4376	26 2 2.7	2.094
5	5 16 6.87	2.5020	24 46 31.9	5.481	5	7 15 31.56	2.4338	25 59 43.4	2.246
6	5 18 37.02	2.5030	24 51 55.9	5.318	6	7 17 57.48	2.4300	25 57 15.1	2.397
7	5 21 7.23	2.5038	24 57 10.1	5.156	7	7 20 23.16	2.4260	25 54 37.9	2.546
8	5 23 37.48	2.5046	25 2 14.6	4.994	8	7 22 48.60	2.4220	25 51 51.8	2.694
9	5 26 7.78	2.5053	25 7 9.4	4.831	9	7 25 13.80	2.4179	25 48 56.8	2.843
10	5 28 38.12	2.5059	25 11 54.3	4.668	10	7 27 38.75	2.4138	25 45 53.0	2.990
11	5 31 8.49	2.5064	25 16 29.5	4.505	11	7 30 3.45	2.4096	25 42 40.4	3.137
12	5 33 38.89	2.5068	25 20 54.9	4.341	12	7 32 27.90	2.4053	25 39 19.1	3.283
13	5 36 9.31	2.5072	25 25 10.4	4.177	13	7 34 52.08	2.4008	25 35 49.1	3.428
14	5 38 39.75	2.5073	25 29 16.1	4.013	14	7 37 15.99	2.3963	25 32 10.6	3.571
15	5 41 10.19	2.5074	25 33 12.0	3.849	15	7 39 39.64	2.3918	25 28 23.5	3.713
16	5 43 40.64	2.5074	25 36 58.0	3.685	16	7 42 3.01	2.3872	25 24 27.9	3.856
17	5 46 11.08	2.5073	25 40 34.2	3.521	17	7 44 26.10	2.3824	25 20 23.9	3.997
18	5 48 41.52	2.5072	25 44 0.5	3.356	18	7 46 48.90	2.3777	25 16 11.4	4.138
19	5 51 11.94	2.5068	25 47 16.9	3.192	19	7 49 11.42	2.3729	25 11 50.6	4.278
20	5 53 42.34	2.5064	25 50 23.5	3.028	20	7 51 33.65	2.3681	25 7 21.6	4.415
21	5 56 12.71	2.5058	25 53 20.2	2.863	21	7 53 55.59	2.3632	25 2 44.4	4.552
22	5 58 43.04	2.5053	25 56 7.0	2.698	22	7 56 17.23	2.3582	24 57 59.0	4.688
23	6 1 13.34	2.5046	25 58 43.9	2.533	23	7 58 38.57	2.3531	N. 24 53 5.5	4.824
24	6 3 43.59	2.5037	N. 26 1 11.0	2.370		8 0 59.60	2.3480		4.958
FRIDAY 18.					SUNDAY 20.				
0	h m s	s	N. 26 3 28.3	"	0	h m s	s	N. 24 48 4.0	"
1	6 6 13.78	2.5027	26 3 28.3	2.206	1	8 3 20.33	2.3429	24 42 54.6	5.091
2	6 8 43.91	2.5017	26 5 35.7	2.042	2	8 5 40.75	2.3377	24 37 37.2	5.223
3	6 11 13.98	2.5005	26 7 33.3	1.878	3	8 8 0.85	2.3324	24 32 12.0	5.355
4	6 13 43.97	2.4992	26 9 21.0	1.713	4	8 10 20.64	2.3272	24 26 39.0	5.485
5	6 16 13.88	2.4978	26 10 58.9	1.550	5	8 12 40.11	2.3218	24 20 58.3	5.614
6	6 18 43.70	2.4963	26 12 27.0	1.388	6	8 14 59.26	2.3165	24 15 10.0	5.742
7	6 21 13.43	2.4948	26 13 45.4	1.225	7	8 17 18.09	2.3111	24 9 14.1	5.868
8	6 23 43.07	2.4931	26 14 54.0	1.062	8	8 19 36.59	2.3057	23 56 59.7	5.995
9	6 26 12.60	2.4913	26 15 52.8	0.899	9	8 21 54.77	2.3002	23 50 41.4	6.120
10	6 28 42.02	2.4893	26 16 41.9	0.738	10	8 24 12.61	2.2946	23 44 15.7	6.243
11	6 31 11.32	2.4873	26 17 21.3	0.576	11	8 26 30.12	2.2891	23 37 42.8	6.367
12	6 33 40.49	2.4852	26 17 51.0	0.415	12	8 28 47.30	2.2836	23 31 2.7	6.488
13	6 36 9.54	2.4830	26 18 11.1	0.254	13	8 31 4.15	2.2780	23 24 15.5	6.608
14	6 38 38.45	2.4806	26 18 21.5	+0.093	14	8 33 20.66	2.2723	23 17 21.3	6.728
15	6 41 7.21	2.4782	26 18 22.3	-0.067	15	8 35 36.83	2.2667	23 10 20.1	6.845
16	6 43 35.83	2.4757	26 18 13.5	0.226	16	8 37 52.66	2.2610	22 55 57.0	6.962
17	6 46 4.29	2.4730	26 17 55.2	0.384	17	8 40 8.15	2.2552	22 48 35.2	7.078
18	6 48 32.59	2.4703	26 17 27.4	0.543	18	8 42 23.29	2.2496	22 41 6.7	7.193
19	6 51 0.72	2.4674	26 16 50.0	0.702	19	8 44 38.10	2.2439	22 33 31.5	7.307
20	6 53 28.68	2.4645	26 16 3.2	0.858	20	8 46 52.56	2.2382	22 25 49.8	7.419
21	6 55 56.46	2.4614	26 15 7.0	1.015	21	8 49 6.68	2.2325	22 18 1.6	7.531
22	6 58 24.05	2.4583	26 14 1.4	1.171	22	8 51 20.46	2.2268	22 10 6.9	7.641
23	7 0 51.46	2.4552	26 12 46.5	1.327	23	8 53 33.89	2.2209		7.749
24	7 3 18.67	2.4518	26 11 22.2	1.482	24	8 55 46.97	2.2152		7.857
	7 5 45.67	2.4483	N. 26 9 48.7	1.636		8 57 59.71	2.2094		7.964



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 21.					WEDNESDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 57 59.71	2.2094	N.22 10 6.9	7.964	0	10 37 40.03	1.9548	N.14 6 33.4	11.758
1	9 0 12.10	2.2037	22 2 5.9	8.069	1	10 39 37.19	1.9505	13 54 46.3	11.811
2	9 2 24.15	2.1979	21 53 58.6	8.174	2	10 41 34.09	1.9462	13 42 56.1	11.863
3	9 4 35.85	2.1921	21 45 45.0	8.277	3	10 43 30.73	1.9419	13 31 2.7	11.914
4	9 6 47.20	2.1863	21 37 25.3	8.379	4	10 45 27.12	1.9377	13 19 6.3	11.964
5	9 8 58.21	2.1806	21 28 59.5	8.480	5	10 47 23.25	1.9334	13 7 7.0	12.013
6	9 11 8.87	2.1748	21 20 27.7	8.580	6	10 49 19.13	1.9293	12 55 4.8	12.060
7	9 13 19.19	2.1691	21 11 49.9	8.679	7	10 51 14.77	1.9253	12 42 59.8	12.107
8	9 15 29.16	2.1633	21 3 6.2	8.777	8	10 53 10.16	1.9213	12 30 52.0	12.153
9	9 17 38.78	2.1575	20 54 16.7	8.873	9	10 55 5.32	1.9173	12 18 41.5	12.198
10	9 19 48.06	2.1518	20 45 21.5	8.968	10	10 57 0.24	1.9133	12 6 28.3	12.242
11	9 21 57.00	2.1461	20 36 20.6	9.062	11	10 58 54.92	1.9094	11 54 12.5	12.284
12	9 24 5.59	2.1404	20 27 14.1	9.154	12	11 0 49.37	1.9057	11 41 54.2	12.326
13	9 26 13.85	2.1348	20 18 2.1	9.246	13	11 2 43.60	1.9019	11 29 33.4	12.367
14	9 28 21.76	2.1290	20 8 44.6	9.337	14	11 4 37.60	1.8982	11 17 10.2	12.407
15	9 30 29.33	2.1234	19 59 21.7	9.427	15	11 6 31.38	1.8946	11 4 44.6	12.446
16	9 32 36.57	2.1178	19 49 53.4	9.515	16	11 8 24.95	1.8910	10 52 16.7	12.484
17	9 34 43.47	2.1122	19 40 19.9	9.602	17	11 10 18.30	1.8874	10 39 46.5	12.522
18	9 36 50.03	2.1066	19 30 41.2	9.688	18	11 12 11.44	1.8840	10 27 14.1	12.558
19	9 38 56.26	2.1010	19 20 57.4	9.773	19	11 14 4.38	1.8806	10 14 39.6	12.593
20	9 41 2.15	2.0955	19 11 8.5	9.857	20	11 15 57.11	1.8773	10 2 3.0	12.628
21	9 43 7.72	2.0900	19 1 14.6	9.940	21	11 17 49.65	1.8739	9 49 24.3	12.661
22	9 45 12.95	2.0844	18 51 15.7	10.022	22	11 19 41.98	1.8706	9 36 43.7	12.693
23	9 47 17.85	2.0790	N.18 41 12.0	10.102	23	11 21 34.12	1.8675	N. 9 24 1.1	12.726
TUESDAY 22.					THURSDAY 24.				
0	9 49 22.43	2.0736	N.18 31 3.5	10.181	0	11 23 26.08	1.8644	N. 9 11 16.6	12.757
1	9 51 26.68	2.0683	18 20 50.3	10.259	1	11 25 17.85	1.8613	8 58 30.3	12.787
2	9 53 30.62	2.0629	18 10 32.4	10.336	2	11 27 9.43	1.8583	8 45 42.2	12.815
3	9 55 34.23	2.0575	18 0 10.0	10.412	3	11 29 0.84	1.8553	8 32 52.5	12.843
4	9 57 37.52	2.0522	17 49 43.0	10.487	4	11 30 52.07	1.8524	8 20 1.1	12.871
5	9 59 40.49	2.0469	17 39 11.6	10.560	5	11 32 43.13	1.8496	8 7 8.0	12.898
6	10 1 43.15	2.0418	17 28 35.8	10.633	6	11 34 34.02	1.8468	7 54 13.4	12.923
7	10 3 45.50	2.0366	17 17 55.7	10.704	7	11 36 24.75	1.8441	7 41 17.3	12.948
8	10 5 47.54	2.0314	17 7 11.3	10.775	8	11 38 15.31	1.8414	7 28 19.7	12.972
9	10 7 49.27	2.0263	16 56 22.7	10.845	9	11 40 5.72	1.8388	7 15 20.7	12.994
10	10 9 50.70	2.0213	16 45 29.9	10.913	10	11 41 55.97	1.8363	7 2 20.4	13.016
11	10 11 51.82	2.0162	16 34 33.1	10.980	11	11 43 46.07	1.8338	6 49 18.8	13.038
12	10 13 52.64	2.0112	16 23 32.3	11.046	12	11 45 36.03	1.8314	6 36 15.9	13.058
13	10 15 53.16	2.0063	16 12 27.6	11.111	13	11 47 25.84	1.8290	6 23 11.8	13.078
14	10 17 53.39	2.0014	16 1 19.0	11.176	14	11 49 15.51	1.8268	6 10 6.6	13.096
15	10 19 53.33	1.9965	15 50 6.5	11.239	15	11 51 5.05	1.8246	5 57 0.3	13.113
16	10 21 52.97	1.9917	15 38 50.3	11.300	16	11 52 54.46	1.8223	5 43 53.0	13.130
17	10 23 52.33	1.9870	15 27 30.5	11.361	17	11 54 43.73	1.8202	5 30 44.7	13.147
18	10 25 51.41	1.9823	15 16 7.0	11.421	18	11 56 32.88	1.8182	5 17 35.4	13.163
19	10 27 50.20	1.9775	15 4 40.0	11.480	19	11 58 21.91	1.8162	5 4 25.2	13.178
20	10 29 48.71	1.9729	14 53 9.4	11.538	20	12 0 10.82	1.8142	4 51 14.1	13.191
21	10 31 46.95	1.9683	14 41 35.4	11.595	21	12 1 59.61	1.8123	4 38 2.3	13.203
22	10 33 44.91	1.9638	14 29 58.0	11.651	22	12 3 48.29	1.8105	4 24 49.7	13.216
23	10 35 42.61	1.9593	14 18 17.3	11.705	23	12 5 36.87	1.8088	4 11 36.4	13.228
24	10 37 40.03	1.9548	N.14 6 33.4	11.758	24	12 7 25.34	1.8070	N. 3 58 22.4	13.238

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 25.					SUNDAY 27.				
0	12 7 25.34	1.8070	N. 3 58 22.4	13.238	0	13 33 20.68	1.7959	S. 6 34 20.3	12.835
1	12 9 13.71	1.8054	3 45 7.8	13.248	1	13 35 8.47	1.7971	6 47 9.6	12.808
2	12 11 1.99	1.8039	3 31 52.7	13.256	2	13 36 56.33	1.7983	6 59 57.3	12.782
3	12 12 50.18	1.8023	3 18 37.1	13.264	3	13 38 44.27	1.7997	7 12 43.4	12.754
4	12 14 38.28	1.8008	3 5 21.0	13.272	4	13 40 32.29	1.8011	7 25 27.8	12.725
5	12 16 26.28	1.7994	2 52 4.5	13.278	5	13 42 20.40	1.8025	7 38 10.4	12.695
6	12 18 14.20	1.7981	2 38 47.7	13.283	6	13 44 8.59	1.8039	7 50 51.2	12.665
7	12 20 2.05	1.7969	2 25 30.5	13.288	7	13 45 56.87	1.8055	8 3 30.2	12.634
8	12 21 49.83	1.7957	2 12 13.1	13.293	8	13 47 45.25	1.8072	8 16 7.3	12.602
9	12 23 37.53	1.7944	1 58 55.4	13.296	9	13 49 33.73	1.8088	8 28 42.4	12.569
10	12 25 25.16	1.7933	1 45 37.6	13.298	10	13 51 22.30	1.8104	8 41 15.6	12.537
11	12 27 12.73	1.7923	1 32 19.6	13.301	11	13 53 10.98	1.8122	8 53 46.8	12.503
12	12 29 0.24	1.7913	1 19 1.5	13.302	12	13 54 59.77	1.8141	9 6 15.9	12.468
13	12 30 47.69	1.7904	1 5 43.4	13.302	13	13 56 48.67	1.8159	9 18 42.9	12.433
14	12 32 35.09	1.7896	0 52 25.3	13.301	14	13 58 37.68	1.8178	9 31 7.8	12.396
15	12 34 22.44	1.7888	0 39 7.3	13.299	15	14 0 26.81	1.8198	9 43 30.4	12.358
16	12 36 9.75	1.7881	0 25 49.4	13.298	16	14 2 16.06	1.8219	9 55 50.8	12.322
17	12 37 57.01	1.7873	N. 0 12 31.6	13.295	17	14 4 5.44	1.8240	10 8 9.0	12.283
18	12 39 44.23	1.7868	S. 0 0 46.0	13.291	18	14 5 54.94	1.8261	10 20 24.8	12.244
19	12 41 31.42	1.7863	0 14 3.3	13.287	19	14 7 44.57	1.8283	10 32 38.3	12.205
20	12 43 18.58	1.7858	0 27 20.4	13.282	20	14 9 34.34	1.8306	10 44 49.4	12.164
21	12 45 5.71	1.7853	0 40 37.1	13.276	21	14 11 24.24	1.8328	10 56 58.0	12.123
22	12 46 52.81	1.7849	0 53 53.5	13.269	22	14 13 14.28	1.8352	11 9 4.1	12.080
23	12 48 39.90	1.7847	S. 1 7 9.4	13.262	23	14 15 4.47	1.8377	S. 11 21 7.6	12.037
SATURDAY 26.					MONDAY 28.				
0	12 50 26.97	1.7844	S. 1 20 24.9	13.254	0	14 16 54.80	1.8401	S. 11 33 8.5	11.993
1	12 52 14.03	1.7842	1 33 39.9	13.245	1	14 18 45.28	1.8427	11 45 6.8	11.949
2	12 54 1.07	1.7840	1 46 54.3	13.235	2	14 20 35.92	1.8453	11 57 2.4	11.904
3	12 55 48.11	1.7839	2 0 8.1	13.224	3	14 22 26.71	1.8478	12 8 55.3	11.858
4	12 57 35.14	1.7839	2 13 21.2	13.213	4	14 24 17.66	1.8505	12 20 45.4	11.812
5	12 59 22.18	1.7840	2 26 33.7	13.202	5	14 26 8.77	1.8532	12 32 32.7	11.764
6	13 1 9.22	1.7840	2 39 45.4	13.189	6	14 28 0.04	1.8559	12 44 17.1	11.716
7	13 2 56.26	1.7842	2 52 56.4	13.176	7	14 29 51.48	1.8588	12 55 58.6	11.668
8	13 4 43.32	1.7845	3 6 6.5	13.162	8	14 31 43.10	1.8618	13 7 37.2	11.618
9	13 6 30.40	1.7848	3 19 15.8	13.147	9	14 33 34.89	1.8646	13 19 12.7	11.567
10	13 8 17.49	1.7850	3 32 24.1	13.131	10	14 35 26.85	1.8675	13 30 45.2	11.516
11	13 10 4.60	1.7854	3 45 31.5	13.115	11	14 37 18.99	1.8705	13 42 14.6	11.464
12	13 11 51.74	1.7859	3 58 37.9	13.098	12	14 39 11.31	1.8736	13 53 40.9	11.412
13	13 13 38.91	1.7864	4 11 43.2	13.080	13	14 41 3.82	1.8768	14 5 4.0	11.358
14	13 15 26.11	1.7870	4 24 47.5	13.062	14	14 42 56.52	1.8798	14 16 23.8	11.303
15	13 17 13.35	1.7876	4 37 50.6	13.042	15	14 44 49.40	1.8830	14 27 40.4	11.248
16	13 19 0.62	1.7883	4 50 52.5	13.022	16	14 46 42.48	1.8863	14 38 53.6	11.192
17	13 20 47.94	1.7891	5 3 53.2	13.002	17	14 48 35.75	1.8896	14 50 3.4	11.135
18	13 22 35.31	1.7899	5 16 52.7	12.980	18	14 50 29.23	1.8930	15 1 9.8	11.078
19	13 24 22.73	1.7908	5 29 50.8	12.958	19	14 52 22.91	1.8963	15 12 12.8	11.020
20	13 26 10.20	1.7916	5 42 47.6	12.935	20	14 54 16.79	1.8998	15 23 12.2	10.960
21	13 27 57.72	1.7926	5 55 43.0	12.911	21	14 56 10.88	1.9032	15 34 8.0	10.900
22	13 29 45.31	1.7937	6 8 36.9	12.887	22	14 58 5.17	1.9067	15 45 0.2	10.840
23	13 31 32.96	1.7948	6 21 29.4	12.862	23	14 59 59.68	1.9103	15 55 48.8	10.779
24	13 33 20.68	1.7959	S. 6 34 20.3	12.835	24	15 1 54.41	1.9139	S. 16 6 33.7	10.717

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 29.					THURSDAY 31.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	15 1 54.41	1.9139	S. 16 6 33.7	10.717	1	16 38 33.63	2.1221	S. 23 13 36.6	6.753
2	15 3 49.35	1.9173	16 17 14.8	10.653	2	16 40 41.10	2.1268	23 20 18.7	6.649
3	15 5 44.51	1.9213	16 27 52.1	10.589	3	16 42 48.85	2.1315	23 26 54.5	6.544
4	15 7 39.90	1.9250	16 38 25.5	10.524	4	16 44 56.88	2.1362	23 33 24.0	6.439
5	15 9 35.51	1.9288	16 48 55.0	10.459	5	16 47 5.19	2.1408	23 39 47.2	6.333
6	15 11 31.35	1.9325	16 59 20.6	10.393	6	16 49 13.78	2.1455	23 46 4.0	6.226
7	15 13 27.41	1.9363	17 9 42.2	10.326	7	16 51 22.65	2.1502	23 52 14.3	6.118
8	15 15 23.71	1.9403	17 19 59.7	10.258	8	16 53 31.80	2.1548	23 58 18.1	6.009
9	15 17 20.24	1.9442	17 30 13.2	10.190	9	16 55 41.23	2.1594	24 4 15.4	5.900
10	15 19 17.01	1.9482	17 40 22.5	10.120	10	16 57 50.93	2.1640	24 10 6.1	5.790
11	15 21 14.02	1.9522	17 50 27.6	10.050	11	17 0 0.91	2.1687	24 15 50.2	5.678
12	15 23 11.27	1.9562	18 0 28.5	9.979	12	17 2 11.17	2.1733	24 21 27.5	5.566
13	15 25 8.76	1.9603	18 10 25.1	9.907	13	17 4 21.70	2.1778	24 26 58.1	5.453
14	15 27 6.50	1.9643	18 20 17.3	9.834	14	17 6 32.51	2.1823	24 32 21.9	5.340
15	15 29 4.43	1.9684	18 30 5.2	9.761	15	17 8 43.58	2.1868	24 37 38.9	5.226
16	15 31 2.71	1.9726	18 39 48.6	9.686	16	17 10 54.93	2.1914	24 42 49.0	5.110
17	15 33 1.19	1.9768	18 49 27.5	9.610	17	17 13 6.55	2.1958	24 47 52.1	4.993
18	15 34 59.92	1.9810	18 59 1.8	9.534	18	17 15 18.43	2.2003	24 52 48.2	4.877
19	15 36 58.91	1.9853	19 8 31.6	9.457	19	17 17 30.58	2.2048	24 57 37.3	4.759
20	15 38 58.16	1.9896	19 17 56.7	9.379	20	17 19 43.00	2.2092	25 2 19.3	4.640
21	15 40 57.66	1.9938	19 27 17.1	9.301	21	17 21 55.68	2.2134	25 6 54.1	4.521
22	15 42 57.42	1.9982	19 36 32.8	9.222	22	17 24 8.61	2.2178	25 11 21.8	4.401
23	15 44 57.44	2.0026	19 45 43.7	9.142	23	17 26 21.81	2.2221	25 15 42.2	4.280
24	15 46 57.73	2.0070	S. 19 54 49.8	9.060	24	17 28 35.26	2.2263	S. 25 19 55.4	4.158
WEDNESDAY 30.					FRIDAY, APRIL 1.				
0	15 48 58.28	2.0114	S. 20 3 50.9	8.978	0	17 30 48.97	2.2306	S. 25 24 1.2	4.035
1	15 50 59.10	2.0158	20 12 47.1	8.895	PHASES OF THE MOON.				
2	15 53 0.18	2.0203	20 21 38.3	8.812					
3	15 55 1.53	2.0248	20 30 24.5	8.728					
4	15 57 3.15	2.0293	20 39 5.6	8.642					
5	15 59 5.04	2.0338	20 47 41.5	8.555	☾ Last Quarter . . . Mar. 3 19 52.2				
6	16 1 7.20	2.0383	20 56 12.2	8.468					
7	16 3 9.64	2.0429	21 4 37.7	8.380					
8	16 5 12.35	2.0475	21 12 57.8	8.291					
9	16 7 15.34	2.0521	21 21 12.6	8.202	☉ New Moon . . . 11 0 12.4				
10	16 9 18.60	2.0567	21 29 22.0	8.111					
11	16 11 22.14	2.0613	21 37 25.9	8.019					
12	16 13 25.96	2.0660	21 45 24.3	7.927					
13	16 15 30.06	2.0706	21 53 17.2	7.834	☾ First Quarter . . . 17 15 37.3				
14	16 17 34.43	2.0753	22 1 4.4	7.740					
15	16 19 39.09	2.0799	22 8 46.0	7.646					
16	16 21 44.02	2.0846	22 16 21.9	7.550					
17	16 23 49.24	2.0893	22 23 52.0	7.453	☉ Full Moon . . . 25 8 20.7				
18	16 25 54.74	2.0940	22 31 16.2	7.355					
19	16 28 0.52	2.0987	22 38 34.6	7.258	☾ Perigee . . . Mar. 12 11.2				
20	16 30 6.58	2.1033	22 45 47.1	7.158					
21	16 32 12.92	2.1080	22 52 53.6	7.058					
22	16 34 19.54	2.1128	22 59 54.0	6.957					
23	16 36 26.45	2.1174	23 6 48.4	6.855	☾ Apogee . . . 27 23.2				
24	16 38 33.63	2.1221	S. 23 13 36.6	6.753					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Pollux W.	106 52 8	3080	108 20 41	3079	109 49 16	3078	111 17 53	3076
	Regulus W.	70 37 28	3090	72 5 50	3089	73 34 13	3087	75 2 39	3085
	JUPITER W.	26 6 15	3058	27 35 16	3055	29 4 21	3052	30 33 29	3049
	Spica W.	17 5 26	3276	18 30 6	3247	19 55 20	3223	21 21 2	3203
	Antares E.	29 58 54	3118	28 31 6	3122	27 3 23	3125	25 35 44	3129
	α Aquilæ E.	81 27 25	3893	80 13 58	3899	79 0 37	3906	77 47 23	3914
	SUN E.	120 48 12	3483	119 27 29	3482	118 6 45	3480	116 45 58	3477
2	Regulus W.	82 25 34	3069	83 54 22	3064	85 23 16	3059	86 52 16	3053
	JUPITER W.	38 0 16	3029	39 29 53	3024	40 59 36	3018	42 29 26	3012
	Spica W.	28 34 43	3131	30 2 15	3120	31 30 0	3109	32 57 59	3099
	α Aquilæ E.	71 43 24	3962	70 31 7	3974	69 19 2	3988	68 7 11	4003
	SUN E.	110 1 10	3458	108 39 58	3452	107 18 41	3446	105 57 17	3439
3	Regulus W.	94 19 10	3018	95 48 59	3010	97 18 59	3002	98 49 9	2993
	JUPITER W.	50 0 39	2976	51 31 22	2967	53 2 15	2958	54 33 20	2949
	Spica W.	40 21 1	3047	41 50 15	3036	43 19 43	3025	44 49 24	3014
	α Aquilæ E.	62 12 0	4098	61 1 56	4122	59 52 16	4149	58 43 1	4178
	SUN E.	99 8 18	3401	97 46 3	3392	96 23 38	3382	95 1 1	3372
4	Regulus W.	106 23 1	2941	107 54 28	2930	109 26 9	2917	110 58 6	2905
	JUPITER W.	62 11 52	2895	63 44 16	2883	65 16 56	2871	66 49 52	2859
	Spica W.	52 21 24	2954	53 52 34	2941	55 24 0	2928	56 55 44	2915
	α Aquilæ E.	53 4 35	4372	51 58 48	4422	50 53 47	4478	49 49 36	4541
	SUN E.	88 4 54	3314	86 40 59	3301	85 16 50	3288	83 52 25	3274
5	JUPITER W.	74 38 47	2789	76 13 29	2774	77 48 31	2758	79 23 54	2743
	Spica W.	64 38 47	2842	66 12 20	2826	67 46 14	2810	69 20 28	2794
	Antares W.	18 53 41	2912	20 25 45	2885	21 58 23	2860	23 31 33	2835
	SUN E.	76 46 7	3199	75 19 57	3183	73 53 28	3167	72 26 39	3150
6	JUPITER W.	87 26 5	2660	89 3 38	2643	90 41 34	2626	92 19 54	2609
	Spica W.	77 17 4	2710	78 53 31	2693	80 30 20	2675	82 7 33	2657
	Antares W.	31 24 52	2728	33 0 55	2707	34 37 25	2687	36 14 22	2668
	SUN E.	65 7 25	3062	63 38 29	3044	62 9 11	3025	60 39 29	3007
7	JUPITER W.	100 37 37	2518	102 18 25	2500	103 59 38	2482	105 41 17	2464
	Spica W.	90 19 45	2566	91 59 26	2548	93 39 32	2530	95 20 3	2512
	Antares W.	44 25 48	2569	46 5 26	2550	47 45 30	2530	49 26 1	2511
	SUN E.	53 5 13	2913	51 33 11	2894	50 0 44	2876	48 27 54	2857
8	JUPITER W.	114 15 54	2374	116 0 7	2357	117 44 44	2339	119 29 47	2322
	Spica W.	103 49 1	2422	105 32 4	2405	107 15 32	2388	108 59 25	2371
	Antares W.	57 55 17	2417	59 38 27	2398	61 22 4	2380	63 6 7	2363
	SUN E.	40 37 49	2768	39 2 39	2751	37 27 7	2735	35 51 14	2720
13	SUN W.	28 2 35	2415	29 45 48	2415	31 29 2	2414	33 12 17	2415
	Pollux E.	92 26 22	2056	90 34 15	2059	88 42 13	2064	86 50 19	2070
14	SUN W.	41 47 42	2436	43 30 25	2443	45 12 58	2451	46 55 20	2459
	SATURN W.	12 41 23	2143	14 31 16	2150	16 20 59	2158	18 10 30	2166
	Pollux E.	77 33 10	2105	75 42 18	2114	73 51 40	2123	72 1 15	2132

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Pollux	W.	112 46 32	3074	114 15 14	3072	115 43 58	3069	117 12 46	3065
	Regulus	W.	76 31 7	3082	77 59 38	3079	79 28 13	3076	80 56 51	3073
	JUPITER	W.	32 2 42	3046	33 31 58	3042	35 1 19	3038	36 30 45	3034
	Spica	W.	22 47 8	3184	24 13 36	3169	25 40 22	3155	27 7 25	3143
	Antares	E.	24 8 10	3135	22 40 43	3141	21 13 23	3148	19 46 11	3156
	α Aquilæ	E.	76 34 17	3922	75 21 19	3931	74 8 31	3940	72 55 52	3951
	SUN	E.	115 25 8	3474	114 4 15	3471	112 43 18	3467	111 22 16	3463
2	Regulus	W.	88 21 23	3047	89 50 37	3041	91 19 59	3034	92 49 30	3026
	JUPITER	W.	43 59 24	3006	45 29 29	2999	46 59 43	2992	48 30 6	2984
	Spica	W.	34 26 10	3088	35 54 34	3078	37 23 10	3068	38 51 59	3057
	α Aquilæ	E.	66 55 35	4019	65 44 14	4036	64 33 10	4055	63 22 25	4076
	SUN	E.	104 35 45	3433	103 14 6	3426	101 52 19	3418	100 30 23	3410
3	Regulus	W.	100 19 31	2983	101 50 4	2973	103 20 50	2963	104 51 49	2952
	JUPITER	W.	56 4 36	2939	57 36 5	2929	59 7 47	2918	60 39 42	2907
	Spica	W.	46 19 19	3003	47 49 28	2991	49 19 51	2979	50 50 30	2967
	α Aquilæ	E.	57 34 14	4210	56 25 57	4245	55 18 13	4283	54 11 4	4326
	SUN	E.	93 38 13	3362	92 15 13	3351	90 52 0	3339	89 28 34	3327
4	Regulus	W.	112 30 18	2892	114 2 47	2879	115 35 32	2866	117 8 35	2853
	JUPITER	W.	68 23 4	2845	69 56 33	2831	71 30 20	2817	73 4 24	2803
	Spica	W.	58 27 44	2901	60 0 2	2887	61 32 38	2872	63 5 33	2857
	α Aquilæ	E.	48 46 20	4610	47 44 4	4686	46 42 53	4771	45 42 53	4865
	SUN	E.	82 27 43	3260	81 2 45	3246	79 37 30	3231	78 11 58	3215
5	JUPITER	W.	80 59 37	2727	82 35 41	2710	84 12 7	2694	85 48 55	2677
	Spica	W.	70 55 4	2778	72 30 1	2762	74 5 19	2744	75 41 0	2727
	Antares	W.	25 5 15	2812	26 39 27	2791	28 14 7	2769	29 49 16	2748
	SUN	E.	70 59 30	3133	69 32 0	3116	68 4 10	3098	66 35 58	3080
6	JUPITER	W.	93 58 37	2591	95 37 45	2573	97 17 17	2555	98 57 15	2537
	Spica	W.	83 45 11	2639	85 23 13	2621	87 1 39	2603	88 40 30	2585
	Antares	W.	37 51 45	2648	39 29 36	2628	41 7 53	2608	42 46 37	2588
	SUN	E.	59 9 25	2988	57 38 57	2969	56 8 6	2950	54 36 51	2932
7	JUPITER	W.	107 23 21	2446	109 5 51	2428	110 48 46	2410	112 32 7	2391
	Spica	W.	97 1 0	2494	98 42 22	2476	100 24 10	2458	102 6 23	2440
	Antares	W.	51 6 59	2492	52 48 24	2473	54 30 15	2454	56 12 33	2436
	SUN	E.	46 54 40	2839	45 21 2	2821	43 47 1	2803	42 12 36	2785
8	JUPITER	W.	121 15 15	2305	123 1 8	2288	124 47 25	2272	126 34 6	2256
	Spica	W.	110 43 42	2354	112 28 24	2337	114 13 29	2321	115 58 57	2306
	Antares	W.	64 50 35	2345	66 35 29	2328	68 20 47	2311	70 6 30	2294
	SUN	E.	34 15 1	2706	32 38 29	2693	31 1 39	2680	29 24 32	2667
13	SUN	W.	34 55 31	2417	36 38 42	2420	38 21 49	2424	40 4 49	2429
	Pollux	E.	84 58 33	2076	83 6 57	2082	81 15 30	2089	79 24 14	2097
14	SUN	W.	48 37 31	2469	50 19 29	2479	52 1 12	2489	53 42 41	2499
	SATURN	W.	19 59 49	2175	21 48 54	2185	23 37 44	2196	25 26 18	2207
	Pollux	E.	70 11 5	2142	68 21 10	2153	66 31 31	2163	64 42 8	2174

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
14	Regulus	E.	113 47 56	2116	111 57 22	2124	110 7 0	2133	108 16 51	2142
15	SUN	W.	55 23 55	2511	57 4 53	2522	58 45 35	2534	60 26 1	2546
	SATURN	W.	27 14 36	2218	29 2 37	2229	30 50 22	2241	32 37 49	2253
	Pollux	E.	62 53 2	2186	61 4 14	2198	59 15 43	2210	57 27 31	2223
	Regulus	E.	99 9 47	2194	97 21 11	2206	95 32 52	2218	93 44 51	2231
16	SUN	W.	68 43 41	2614	70 22 17	2627	72 0 35	2641	73 38 34	2656
	SATURN	W.	41 30 25	2318	43 15 58	2331	45 1 12	2345	46 46 6	2359
	Pollux	E.	48 31 17	2289	46 45 2	2303	44 59 7	2317	43 13 33	2332
	Regulus	E.	84 49 26	2295	83 3 19	2308	81 17 31	2322	79 32 3	2336
	JUPITER	E.	127 43 23	2249	125 56 9	2263	124 9 15	2276	122 22 40	2289
17	SUN	W.	81 43 33	2729	83 19 34	2744	84 55 16	2759	86 30 38	2773
	SATURN	W.	55 25 39	2429	57 8 33	2442	58 51 8	2456	60 33 23	2470
	MARS	W.	15 46 54	2598	17 25 52	2611	19 4 32	2624	20 42 54	2637
	Pollux	E.	34 30 58	2406	32 47 32	2421	31 4 27	2437	29 21 45	2453
	Regulus	E.	70 49 49	2406	69 6 23	2421	67 23 18	2435	65 40 33	2449
	JUPITER	E.	113 34 37	2357	111 50 0	2370	110 5 42	2384	108 21 44	2397
18	SUN	W.	94 22 41	2846	95 56 9	2861	97 29 18	2875	99 2 9	2889
	SATURN	W.	68 59 48	2538	70 40 8	2552	72 20 9	2565	73 59 52	2578
	MARS	W.	28 50 15	2705	30 26 48	2718	32 3 4	2732	33 39 1	2745
	Aldebaran	W.	24 14 6	2643	25 52 3	2640	27 30 3	2640	29 8 3	2642
	Regulus	E.	57 11 46	2520	55 31 0	2534	53 50 34	2548	52 10 28	2562
	JUPITER	E.	99 46 42	2464	98 4 38	2477	96 22 52	2490	94 41 24	2503
	Spica	E.	111 15 6	2520	109 34 20	2533	107 53 52	2546	106 13 42	2559
19	SUN	W.	106 41 58	2958	108 13 4	2971	109 43 53	2984	111 14 26	2997
	SATURN	W.	82 13 59	2642	83 51 57	2654	85 29 38	2666	87 7 3	2678
	MARS	W.	41 34 26	2811	43 8 40	2823	44 42 37	2835	46 16 19	2848
	Aldebaran	W.	37 16 54	2669	38 54 16	2676	40 31 27	2684	42 8 28	2692
	Regulus	E.	43 54 46	2632	42 16 35	2646	40 38 43	2660	39 1 10	2675
	JUPITER	E.	86 18 35	2565	84 38 53	2577	82 59 27	2589	81 20 17	2601
	Spica	E.	97 57 11	2620	96 18 43	2632	94 40 31	2644	93 2 36	2655
20	SUN	W.	118 43 13	3059	120 12 12	3071	121 40 57	3083	123 9 27	3095
	SATURN	W.	95 10 15	2735	96 46 8	2746	98 21 47	2756	99 57 12	2767
	MARS	W.	54 0 55	2906	55 33 6	2918	57 5 2	2929	58 36 44	2939
	Aldebaran	W.	50 10 44	2736	51 46 36	2745	53 22 16	2754	54 57 44	2763
	Regulus	E.	30 58 20	2751	29 22 47	2767	27 47 36	2785	26 12 48	2804
	JUPITER	E.	73 8 21	2657	71 30 43	2667	69 53 19	2678	68 16 9	2688
	Spica	E.	84 56 52	2712	83 20 28	2723	81 44 18	2734	80 8 23	2744
21	SATURN	W.	107 50 55	2816	109 25 1	2825	110 58 56	2835	112 32 39	2844
	MARS	W.	66 11 56	2991	67 42 20	3000	69 12 33	3009	70 42 34	3019
	Aldebaran	W.	62 52 14	2806	64 26 34	2815	66 0 43	2823	67 34 41	2831
	Pollux	W.	18 40 14	2818	20 14 19	2822	21 48 19	2826	23 22 13	2831
	JUPITER	E.	60 13 41	2737	58 37 50	2746	57 2 11	2755	55 26 44	2764
	Spica	E.	72 12 9	2795	70 37 34	2804	69 3 11	2813	67 29 0	2822
22	MARS	W.	78 9 47	3064	79 38 41	3072	81 7 25	3080	82 35 59	3088

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
14	Regulus E.	106 26 56	2152	104 37 15	2162	102 47 50	2172	100 58 40	2183
15	SUN W.	62 6 9	2559	63 46 0	2573	65 25 32	2586	67 4 46	2600
	SATURN W.	34 24 58	2266	36 11 48	2278	37 58 20	2291	39 44 32	2304
	Pollux E.	55 39 38	2236	53 52 4	2249	52 4 49	2262	50 17 53	2275
	Regulus E.	91 57 9	2243	90 9 45	2256	88 22 40	2268	86 35 53	2281
16	SUN W.	75 16 13	2671	76 53 32	2685	78 30 32	2700	80 7 12	2714
	SATURN W.	48 30 41	2373	50 14 55	2387	51 58 50	2401	53 42 24	2415
	Pollux E.	41 28 20	2346	39 43 28	2361	37 58 57	2375	36 14 47	2390
	Regulus E.	77 46 56	2350	76 2 9	2364	74 17 42	2378	72 33 35	2391
	JUPITER E.	120 36 24	2302	118 50 28	2315	117 4 51	2329	115 19 34	2343
17	SUN W.	88 5 41	2788	89 40 25	2803	91 14 49	2817	92 48 54	2831
	SATURN W.	62 15 19	2484	63 56 55	2498	65 38 12	2512	67 19 9	2525
	MARS W.	22 20 59	2651	23 58 45	2664	25 36 13	2678	27 13 23	2691
	Pollux E.	27 39 25	2470	25 57 29	2486	24 15 56	2503	22 34 47	2520
	Regulus E.	63 58 7	2463	62 16 2	2477	60 34 17	2491	58 52 52	2505
	JUPITER E.	106 38 5	2410	104 54 45	2424	103 11 45	2438	101 29 4	2451
18	SUN W.	100 34 42	2903	102 6 57	2917	103 38 55	2931	105 10 35	2944
	SATURN W.	75 39 17	2591	77 18 24	2604	78 57 13	2617	80 35 45	2630
	MARS W.	35 14 41	2759	36 50 3	2772	38 25 8	2785	39 59 55	2798
	Aldebaran W.	30 46 1	2645	32 23 54	2649	34 1 42	2655	35 39 22	2661
	Regulus E.	50 30 41	2576	48 51 13	2590	47 12 5	2604	45 33 16	2618
	JUPITER E.	93 0 15	2516	91 19 24	2528	89 38 50	2541	87 58 34	2553
	Spica E.	104 33 50	2571	102 54 15	2583	101 14 57	2595	99 35 56	2607
19	SUN W.	112 44 43	3009	114 14 44	3022	115 44 29	3034	117 13 59	3047
	SATURN W.	88 44 13	2690	90 21 6	2701	91 57 44	2713	93 34 7	2724
	MARS W.	47 49 45	2860	49 22 55	2872	50 55 50	2883	52 28 30	2895
	Aldebaran W.	43 45 18	2701	45 21 57	2710	46 58 24	2718	48 34 40	2727
	Regulus E.	37 23 57	2689	35 47 3	2704	34 10 29	2719	32 34 14	2735
	JUPITER E.	79 41 23	2612	78 2 45	2624	76 24 22	2635	74 46 14	2646
	Spica E.	91 24 56	2667	89 47 32	2679	88 10 24	2690	86 33 31	2701
20	SUN W.	124 37 43	3106	126 5 45	3118	127 33 33	3129	129 1 8	3140
	SATURN W.	101 32 23	2777	103 7 21	2788	104 42 5	2798	106 16 36	2807
	MARS W.	60 8 13	2950	61 39 28	2961	63 10 30	2971	64 41 19	2981
	Aldebaran W.	56 33 1	2772	58 8 6	2780	59 43 0	2789	61 17 43	2798
	Regulus E.	24 38 24	2824	23 4 26	2846	21 30 58	2871	19 58 2	2898
	JUPITER E.	66 39 13	2698	65 2 30	2708	63 26 1	2718	61 49 45	2727
	Spica E.	78 32 41	2754	76 57 13	2765	75 21 59	2775	73 46 58	2785
21	SATURN W.	114 6 10	2853	115 39 30	2862	117 12 38	2870	118 45 35	2879
	MARS W.	72 12 23	3028	73 42 1	3038	75 11 27	3047	76 40 42	3055
	Aldebaran W.	69 8 29	2839	70 42 6	2848	72 15 32	2855	73 48 48	2863
	Pollux W.	24 56 1	2836	26 29 42	2842	28 3 16	2848	29 36 42	2855
	JUPITER E.	53 51 29	2773	52 16 26	2782	50 41 34	2790	49 6 53	2798
	Spica E.	65 55 1	2831	64 21 14	2841	62 47 39	2850	61 14 16	2859
22	MARS W.	84 4 24	3096	85 32 39	3104	87 0 44	3111	88 28 40	3118

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
22	Aldebaran	W.	75 21 55	2871	76 54 51	2878	78 27 38	2886	80 0 15	2893
	Pollux	W.	31 9 59	2861	32 43 8	2868	34 16 8	2874	35 49 0	2880
	JUPITER	E.	47 32 23	2807	45 58 4	2815	44 23 56	2823	42 49 58	2831
	Spica	E.	59 41 4	2868	58 8 4	2876	56 35 15	2885	55 2 37	2894
	Antares	E.	105 32 44	2855	103 59 28	2862	102 26 20	2869	100 53 22	2876
23	MARS	W.	89 56 28	3126	91 24 6	3133	92 51 36	3140	94 18 57	3147
	Aldebaran	W.	87 41 2	2929	89 12 44	2935	90 44 18	2942	92 15 43	2949
	Pollux	W.	43 31 16	2913	45 3 18	2919	46 35 12	2925	48 6 59	2931
	JUPITER	E.	35 2 40	2869	33 29 42	2877	31 56 54	2885	30 24 16	2892
	Spica	E.	47 22 11	2936	45 50 38	2945	44 19 16	2954	42 48 5	2962
	Antares	E.	93 10 53	2912	91 38 50	2919	90 6 56	2926	88 35 10	2933
24	MARS	W.	101 33 42	3179	103 0 16	3185	104 26 43	3192	105 53 2	3198
	Aldebaran	W.	99 50 47	2980	101 21 24	2986	102 51 54	2993	104 22 16	2999
	Pollux	W.	55 43 58	2961	57 15 0	2966	58 45 55	2972	60 16 43	2977
	Regulus	W.	19 51 45	3070	21 20 31	3062	22 49 27	3056	24 18 31	3051
	Spica	E.	35 14 57	3009	33 44 54	3019	32 15 5	3030	30 45 29	3042
	Antares	E.	80 58 24	2964	79 27 26	2970	77 56 35	2975	76 25 52	2981
25	Aldebaran	W.	111 52 14	3027	113 21 53	3033	114 51 25	3039	116 20 50	3044
	Pollux	W.	67 49 4	3003	69 19 13	3007	70 49 17	3012	72 19 15	3017
	Regulus	W.	31 44 40	3047	33 13 55	3048	34 43 8	3049	36 12 20	3051
	Antares	E.	68 54 0	3008	67 23 57	3013	65 54 1	3018	64 24 11	3023
26	Pollux	W.	79 47 43	3037	81 17 10	3041	82 46 32	3044	84 15 50	3048
	Regulus	W.	43 37 44	3062	45 6 40	3064	46 35 34	3066	48 4 25	3069
	Antares	E.	56 56 29	3046	55 27 13	3051	53 58 3	3055	52 28 58	3059
27	Pollux	W.	91 41 18	3063	93 10 13	3065	94 39 6	3067	96 7 56	3069
	Regulus	W.	55 27 59	3079	56 56 35	3081	58 25 8	3082	59 53 39	3083
	JUPITER	W.	13 56 22	3064	15 25 16	3059	16 54 17	3054	18 23 23	3050
	Antares	E.	45 4 42	3077	43 36 4	3080	42 7 30	3083	40 39 1	3087
28	Pollux	W.	103 31 31	3076	105 0 10	3077	106 28 48	3078	107 57 25	3078
	Regulus	W.	67 15 53	3088	68 44 18	3088	70 12 42	3089	71 41 5	3088
	JUPITER	W.	25 49 43	3042	27 19 4	3041	28 48 26	3040	30 17 50	3039
	Antares	E.	33 17 35	3103	31 49 29	3107	30 21 28	3110	28 53 31	3114
29	Regulus	W.	79 3 10	3084	80 31 38	3082	82 0 9	3080	83 28 43	3078
	JUPITER	W.	37 45 10	3031	39 14 44	3029	40 44 20	3026	42 14 0	3024
	Spica	W.	25 14 8	3161	26 41 4	3151	28 8 13	3141	29 35 33	3132
30	Regulus	W.	90 52 18	3062	92 21 14	3058	93 50 14	3053	95 19 20	3048
	JUPITER	W.	49 43 12	3007	51 13 16	3003	52 43 25	2998	54 13 41	2993
	Spica	W.	36 54 38	3095	38 22 54	3087	39 51 19	3080	41 19 53	3073
	SUN	E.	129 27 8	3443	128 5 40	3437	126 44 6	3431	125 22 25	3425
31	Regulus	W.	102 46 31	3019	104 16 20	3012	105 46 17	3005	107 16 24	2997
	JUPITER	W.	61 46 43	2962	63 17 44	2955	64 48 53	2947	66 20 12	2939
	Spica	W.	48 45 0	3034	50 14 31	3026	51 44 12	3017	53 14 4	3007
	SUN	E.	118 32 10	3390	117 9 42	3382	115 47 5	3373	114 24 17	3364



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
22	Aldebaran	W.	81 32 43	2901	83 5 1	2908	84 37 10	2915	86 9 10	2922
	Pollux	W.	37 21 44	2887	38 54 20	2894	40 26 47	2900	41 59 6	2907
	JUPITER	E.	41 16 10	2839	39 42 33	2847	38 9 5	2855	36 35 48	2862
	Spica	E.	53 30 10	2902	51 57 54	2911	50 25 49	2919	48 53 55	2927
	Antares	E.	99 20 33	2884	97 47 54	2892	96 15 25	2899	94 43 5	2905
23	MARS	W.	95 46 10	3154	97 13 14	3160	98 40 11	3167	100 7 0	3173
	Aldebaran	W.	93 47 0	2956	95 18 8	2962	96 49 9	2968	98 20 2	2974
	Pollux	W.	49 38 38	2937	51 10 9	2943	52 41 33	2949	54 12 49	2955
	JUPITER	E.	28 51 47	2901	27 19 29	2909	25 47 21	2916	24 15 23	2924
	Spica	E.	41 17 4	2971	39 46 15	2980	38 15 37	2989	36 45 11	2999
	Antares	E.	87 3 33	2939	85 32 4	2946	84 0 43	2952	82 29 30	2958
24	MARS	W.	107 19 14	3203	108 45 20	3209	110 11 18	3214	111 37 10	3220
	Aldebaran	W.	105 52 30	3005	107 22 37	3011	108 52 36	3017	110 22 28	3022
	Pollux	W.	61 47 24	2982	63 17 58	2987	64 48 27	2993	66 18 49	2998
	Regulus	W.	25 47 41	3048	27 16 54	3047	28 46 9	3047	30 15 24	3046
	Spica	E.	29 16 7	3054	27 47 1	3067	26 18 11	3082	24 49 39	3098
	Antares	E.	74 55 16	2987	73 24 47	2993	71 54 25	2998	70 24 9	3003
25	Aldebaran	W.	117 50 8	3050	119 19 19	3055	120 48 24	3060	122 17 22	3065
	Pollux	W.	73 49 7	3021	75 18 54	3026	76 48 35	3030	78 18 11	3033
	Regulus	W.	37 41 30	3053	39 10 37	3055	40 39 42	3057	42 8 44	3059
	Antares	E.	62 54 27	3028	61 24 49	3033	59 55 17	3037	58 25 50	3042
26	Pollux	W.	85 45 3	3052	87 14 12	3055	88 43 17	3057	90 12 19	3060
	Regulus	W.	49 33 13	3071	51 1 58	3073	52 30 41	3075	53 59 21	3077
	Antares	E.	50 59 58	3063	49 31 2	3066	48 2 11	3069	46 33 24	3073
27	Pollux	W.	97 36 43	3071	99 5 27	3073	100 34 10	3074	102 2 51	3075
	Regulus	W.	61 22 9	3085	62 50 37	3086	64 19 3	3087	65 47 28	3087
	JUPITER	W.	19 52 34	3047	21 21 48	3045	22 51 4	3044	24 20 23	3043
	Antares	E.	39 10 36	3091	37 42 15	3094	36 13 58	3097	34 45 45	3100
28	Pollux	W.	109 26 2	3078	110 54 39	3078	112 23 17	3078	113 51 54	3078
	Regulus	W.	73 9 29	3088	74 37 53	3087	76 6 18	3087	77 34 43	3086
	JUPITER	W.	31 47 15	3038	33 16 41	3036	34 46 9	3035	36 15 39	3033
	Antares	E.	27 25 39	3119	25 57 52	3124	24 30 11	3129	23 2 37	3133
29	Regulus	W.	84 57 19	3076	86 25 58	3073	87 54 41	3070	89 23 27	3066
	JUPITER	W.	43 43 43	3021	45 13 29	3018	46 43 19	3015	48 13 13	3011
	Spica	W.	31 3 3	3124	32 30 43	3117	33 58 32	3109	35 26 31	3102
30	Regulus	W.	96 48 33	3043	98 17 52	3038	99 47 17	3032	101 16 50	3026
	JUPITER	W.	55 44 3	2987	57 14 32	2981	58 45 8	2975	60 15 51	2969
	Spica	W.	42 48 36	3065	44 17 28	3058	45 46 29	3050	47 15 40	3042
	SUN	E.	124 0 37	3419	122 38 42	3412	121 16 40	3405	119 54 29	3398
31	Regulus	W.	108 46 41	2989	110 17 8	2980	111 47 45	2971	113 18 34	2962
	JUPITER	W.	67 51 42	2931	69 23 22	2922	70 55 13	2912	72 27 16	2902
	Spica	W.	54 44 8	2998	56 14 23	2988	57 44 51	2978	59 15 32	2968
	SUN	E.	113 1 19	3354	111 38 10	3344	110 14 49	3333	108 51 16	3323

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Equation of Time, to be Added to	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Sidereal Time of Semi-diameter Passing Meridian.	Subtracted from Apparent Time.	
		h m s	s	° ' "	"	' "	s	m s	s
Frid.	1	0 40 0.46	9.098	N. 4 18 31.4	+ 57.96	16 1.92	64.47	4 8.17	0.757
Sat.	2	0 43 38.87	9.103	4 41 40.3	57.76	16 1.64	64.48	3 50.06	0.752
SUN.	3	0 47 17.40	9.109	5 4 44.2	57.55	16 1.36	64.50	3 32.09	0.746
Mon.	4	0 50 56.08	9.115	5 27 42.9	+ 57.32	16 1.08	64.52	3 14.27	0.739
Tues.	5	0 54 34.93	9.123	5 50 36.0	57.08	16 0.80	64.55	2 56.62	0.731
Wed.	6	0 58 13.97	9.131	6 13 23.2	56.83	16 0.51	64.58	2 39.16	0.723
Thur.	7	1 1 53.22	9.140	6 36 4.1	+ 56.56	16 0.23	64.61	2 21.90	0.714
Frid.	8	1 5 32.69	9.149	6 58 38.2	56.27	15 59.95	64.64	2 4.86	0.705
Sat.	9	1 9 12.40	9.159	7 21 5.3	55.97	15 59.68	64.68	1 48.05	0.695
SUN.	10	1 12 52.35	9.169	7 43 25.0	+ 55.65	15 59.41	64.71	1 31.49	0.685
Mon.	11	1 16 32.56	9.180	8 5 36.9	55.32	15 59.14	64.75	1 15.19	0.674
Tues.	12	1 20 13.04	9.192	8 27 40.7	54.98	15 58.87	64.79	0 59.16	0.662
Wed.	13	1 23 53.80	9.204	8 49 35.9	+ 54.61	15 58.61	64.84	0 43.41	0.650
Thur.	14	1 27 34.85	9.217	9 11 22.2	54.23	15 58.34	64.88	0 27.96	0.637
Frid.	15	1 31 16.22	9.231	9 32 59.2	53.84	15 58.08	64.93	0 12.82	0.624
Sat.	16	1 34 57.92	9.245	9 54 26.6	+ 53.43	15 57.82	64.98	0 2.00	0.610
SUN.	17	1 38 39.96	9.260	10 15 44.1	53.01	15 57.56	65.04	0 16.48	0.595
Mon.	18	1 42 22.35	9.275	10 36 51.4	52.58	15 57.30	65.10	0 30.61	0.580
Tues.	19	1 46 5.12	9.291	10 57 48.1	+ 52.13	15 57.04	65.16	0 44.36	0.564
Wed.	20	1 49 48.28	9.307	11 18 33.9	51.67	15 56.78	65.22	0 57.71	0.548
Thur.	21	1 53 31.84	9.324	11 39 8.4	51.19	15 56.53	65.28	1 10.66	0.531
Frid.	22	1 57 15.83	9.342	11 59 31.3	+ 50.70	15 56.27	65.34	1 23.19	0.513
Sat.	23	2 1 0.25	9.361	12 19 42.4	50.20	15 56.02	65.41	1 35.29	0.494
SUN.	24	2 4 45.12	9.380	12 39 41.4	49.68	15 55.77	65.48	1 46.94	0.475
Mon.	25	2 8 30.46	9.400	12 59 27.9	+ 49.16	15 55.52	65.55	1 58.13	0.455
Tues.	26	2 12 16.28	9.420	13 19 1.6	48.62	15 55.26	65.62	2 8.84	0.435
Wed.	27	2 16 2.60	9.441	13 38 22.3	48.07	15 55.01	65.69	2 19.05	0.414
Thur.	28	2 19 49.43	9.462	13 57 29.6	+ 47.51	15 54.76	65.76	2 28.75	0.393
Frid.	29	2 23 36.77	9.484	14 16 23.3	46.94	15 54.51	65.83	2 37.93	0.371
Sat.	30	2 27 24.64	9.506	14 35 2.9	46.35	15 54.26	65.91	2 46.59	0.349
SUN.	31	2 31 13.05	9.529	N. 14 53 28.3	+ 45.74	15 54.02	65.99	2 54.71	0.326

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Added to Mean Time.		
Frid.	1	<sup>h</sup> 0 <sup>m</sup> 39 <sup>s</sup> 59.83	<sup>s</sup> 9.100	N. 4 18 27.4	" + 57.97	<sup>m</sup> 4 <sup>s</sup> 8.21	<sup>s</sup> 0.757	<sup>h</sup> 0 <sup>m</sup> 35 <sup>s</sup> 51.62
Sat.	2	0 43 38.28	9.105	4 41 36.6	57.77	3 50.10	0.752	0 39 48.17
SUN.	3	0 47 16.85	9.111	5 4 40.8	57.56	3 32.12	0.746	0 43 44.73
Mon.	4	0 50 55.58	9.118	5 27 39.8	+ 57.34	3 14.30	0.739	0 47 41.28
Tues.	5	0 54 34.48	9.125	5 50 33.2	57.10	2 56.65	0.731	0 51 37.83
Wed.	6	0 58 13.57	9.133	6 13 20.7	56.84	2 39.18	0.723	0 55 34.39
Thur.	7	1 1 52.86	9.142	6 36 1.8	+ 56.57	2 21.92	0.714	0 59 30.94
Frid.	8	1 5 32.37	9.151	6 58 36.2	56.29	2 4.88	0.705	1 3 27.50
Sat.	9	1 9 12.12	9.161	7 21 3.6	55.99	1 48.07	0.695	1 7 24.05
SUN.	10	1 12 52.11	9.172	7 43 23.6	+ 55.67	1 31.51	0.685	1 11 20.60
Mon.	11	1 16 32.36	9.183	8 5 35.8	55.34	1 15.20	0.674	1 15 17.16
Tues.	12	1 20 12.88	9.194	8 27 39.8	54.99	0 59.17	0.662	1 19 13.71
Wed.	13	1 23 53.68	9.206	8 49 35.2	+ 54.62	0 43.42	0.650	1 23 10.26
Thur.	14	1 27 34.77	9.219	9 11 21.7	54.24	0 27.96	0.637	1 27 6.82
Frid.	15	1 31 16.18	9.232	9 32 59.0	53.85	0 12.81	0.624	1 31 3.37
Sat.	16	1 34 57.92	9.246	9 54 26.7	+ 53.44	0 2.01	0.610	1 34 59.93
SUN.	17	1 38 40.00	9.260	10 15 44.4	53.02	0 16.49	0.595	1 38 56.48
Mon.	18	1 42 22.43	9.276	10 36 51.8	52.59	0 30.61	0.580	1 42 53.04
Tues.	19	1 46 5.23	9.292	10 57 48.7	+ 52.14	0 44.36	0.564	1 46 49.59
Wed.	20	1 49 48.42	9.308	11 18 34.7	51.68	0 57.72	0.548	1 50 46.14
Thur.	21	1 53 32.01	9.325	11 39 9.4	51.20	1 10.68	0.531	1 54 42.70
Frid.	22	1 57 16.03	9.343	11 59 32.5	+ 50.71	1 23.22	0.513	1 58 39.25
Sat.	23	2 1 0.49	9.362	12 19 43.7	50.21	1 35.32	0.494	2 2 35.81
SUN.	24	2 4 45.39	9.381	12 39 42.8	49.70	1 46.97	0.475	2 6 32.36
Mon.	25	2 8 30.76	9.400	12 59 29.4	+ 49.17	1 58.16	0.455	2 10 28.92
Tues.	26	2 12 16.61	9.421	13 19 3.3	48.63	2 8.87	0.435	2 14 25.47
Wed.	27	2 16 2.96	9.442	13 38 24.1	48.08	2 19.08	0.414	2 18 22.03
Thur.	28	2 19 49.81	9.463	13 57 31.5	+ 47.52	2 28.78	0.393	2 22 18.58
Frid.	29	2 23 37.18	9.485	14 16 25.3	46.94	2 37.96	0.371	2 26 15.14
Sat.	30	2 27 25.07	9.507	14 35 5.0	46.35	2 46.62	0.349	2 30 11.69
SUN.	31	2 31 13.51	9.530	N. 14 53 30.4	+ 45.75	2 54.74	0.326	2 34 8.25

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour.  
+9°.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	91	19 53 4.8	53 7.6	147.95	— 0.64	9.999 8082	+ 53.1	<sup>h</sup> <sup>m</sup> <sup>s</sup> 23 20 18.34
2	92	19 52 14.5	52 17.2	147.87	0.74	9.999 9359	53.2	23 16 22.44
3	93	19 51 22.4	51 25.9	147.79	0.83	0.000 0636	53.2	23 12 26.53
4	94	19 50 28.6	50 31.1	147.72	— 0.90	0.000 1912	+ 53.1	23 8 30.62
5	95	19 49 33.0	49 35.4	147.65	0.94	0.000 3185	52.9	23 4 34.71
6	96	19 48 35.7	48 37.9	147.57	0.95	0.000 4453	52.7	23 0 38.81
7	97	19 47 36.6	47 38.7	147.49	— 0.93	0.000 5714	+ 52.4	22 56 42.90
8	98	19 46 35.6	46 37.6	147.42	0.87	0.000 6967	52.0	22 52 46.99
9	99	19 45 32.7	45 34.6	147.34	0.78	0.000 8212	51.6	22 48 51.09
10	100	19 44 27.8	44 29.6	147.25	— 0.66	0.000 9446	+ 51.2	22 44 55.18
11	101	20 43 20.9	43 22.6	147.17	0.53	0.001 0670	50.8	22 40 59.27
12	102	20 42 11.8	42 13.4	147.08	0.40	0.001 1884	50.4	22 37 3.36
13	103	22 41 0.5	41 2.0	146.99	— 0.26	0.001 3088	+ 50.0	22 33 7.45
14	104	23 39 47.0	39 48.4	146.89	0.13	0.001 4283	49.7	22 29 11.54
15	105	24 38 31.3	38 32.5	146.80	— 0.01	0.001 5471	49.4	22 25 15.63
16	106	25 37 13.3	37 14.4	146.71	+ 0.10	0.001 6652	+ 49.1	22 21 19.73
17	107	26 35 53.1	35 54.1	146.61	0.17	0.001 7828	48.9	22 17 23.82
18	108	27 34 30.6	34 31.5	146.52	0.21	0.001 8999	48.7	22 13 27.91
19	109	28 33 5.9	33 6.7	146.43	+ 0.23	0.002 0166	+ 48.6	22 9 32.00
20	110	29 31 39.1	31 39.8	146.34	0.21	0.002 1330	48.4	22 5 36.09
21	111	30 30 10.2	30 10.7	146.25	0.17	0.002 2490	48.3	22 1 40.18
22	112	31 28 39.2	28 39.6	146.17	+ 0.10	0.002 3648	+ 48.2	21 57 44.27
23	113	32 27 6.2	27 6.5	146.09	0.00	0.002 4804	48.1	21 53 48.37
24	114	33 25 31.4	25 31.5	146.01	— 0.11	0.002 5957	47.9	21 49 52.46
25	115	34 23 54.7	23 54.7	145.93	— 0.23	0.002 7107	+ 47.8	21 45 56.55
26	116	35 22 16.2	22 16.0	145.86	0.36	0.002 8254	47.6	21 42 0.64
27	117	36 20 35.9	20 35.6	145.79	0.48	0.002 9397	47.5	21 38 4.73
28	118	37 18 53.9	18 53.5	145.72	— 0.59	0.003 0535	+ 47.3	21 34 8.82
29	119	38 17 10.3	17 9.8	145.65	0.70	0.003 1668	47.1	21 30 12.91
30	120	39 15 25.2	15 24.6	145.59	0.80	0.003 2794	46.8	21 26 17.00
31	121	40 13 38.6	13 37.8	145.53	— 0.87	0.003 3913	+ 46.5	21 22 21.09
NOTE.—The numbers in column $\lambda$ correspond to the true equinox of the date; in column $\lambda'$ to the mean equinox of January 0 <sup>h</sup> .0.								Diff. for 1 Hour, — 9 <sup>h</sup> .8295. (Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	
							h m	m	d
1	15 1.4	15 6.2	55 2.4	+ 1.36	55 19.9	+ 1.55	17 31.8	2.21	21.0
2	15 11.5	15 17.4	55 39.5	1.73	56 1.3	1.90	18 25.8	2.28	22.0
3	15 23.9	15 30.9	56 25.1	2.05	56 50.6	2.19	19 20.8	2.30	23.0
4	15 38.3	15 46.0	57 17.6	+ 2.30	57 45.8	+ 2.37	20 15.7	2.27	24.0
5	15 53.8	16 1.7	58 14.5	2.40	58 43.4	2.39	21 9.6	2.23	25.0
6	16 9.4	16 16.8	59 11.8	2.32	59 39.0	2.19	22 2.4	2.18	26.0
7	16 23.7	16 29.9	60 4.2	+ 2.00	60 26.9	+ 1.75	22 54.4	2.16	27.0
8	16 35.1	16 39.3	60 46.2	1.45	61 1.6	1.09	23 46.4	2.18	28.0
9	16 42.3	16 44.0	61 12.5	+ 0.71	61 18.7	+ 0.30	. . .	. .	29.0
10	16 44.3	16 43.2	61 19.8	- 0.11	61 15.9	- 0.52	0 39.3	2.25	0.6
11	16 40.9	16 37.3	61 7.3	0.90	60 54.2	1.25	1 34.3	2.34	1.6
12	16 32.7	16 27.1	60 37.2	1.56	60 16.8	1.80	2 31.7	2.44	2.6
13	16 20.8	16 14.0	59 53.8	- 2.00	59 28.8	- 2.14	3 31.4	2.53	3.6
14	16 6.9	15 59.5	59 2.5	2.22	58 35.5	2.25	4 32.1	2.52	4.6
15	15 52.2	15 44.9	58 8.5	2.24	57 41.8	2.19	5 31.8	2.44	5.6
16	15 37.8	15 31.1	57 16.0	- 2.10	56 51.3	- 2.00	6 28.8	2.30	6.6
17	15 24.8	15 18.9	56 28.0	1.88	56 6.3	1.74	7 21.8	2.12	7.6
18	15 13.4	15 8.4	55 46.3	1.59	55 28.1	1.44	8 10.7	1.96	8.6
19	15 4.0	15 0.1	55 11.7	- 1.30	54 57.1	- 1.14	8 55.9	1.82	9.6
20	14 56.6	14 53.5	54 44.2	1.00	54 33.1	0.86	9 38.3	1.72	10.6
21	14 50.9	14 48.8	54 23.6	0.73	54 15.7	0.60	10 18.9	1.67	11.6
22	14 47.1	14 45.7	54 9.3	- 0.47	54 4.4	- 0.35	10 58.7	1.65	12.6
23	14 44.7	14 44.1	54 0.8	0.24	53 58.6	- 0.13	11 38.6	1.68	13.6
24	14 43.9	14 44.0	53 57.7	- 0.02	53 58.1	+ 0.09	12 19.6	1.75	14.6
25	14 44.4	14 45.2	53 59.8	+ 0.20	54 2.9	+ 0.30	13 2.5	1.83	15.6
26	14 46.4	14 48.0	54 7.3	0.43	54 13.2	0.55	13 47.8	1.95	16.6
27	14 50.0	14 52.4	54 20.6	0.68	54 29.5	0.81	14 35.9	2.06	17.6
28	14 55.3	14 58.7	54 40.0	+ 0.95	54 52.3	+ 1.09	15 26.7	2.16	18.6
29	15 2.5	15 6.8	55 6.3	1.24	55 22.1	1.39	16 19.5	2.23	19.6
30	15 11.6	15 16.9	55 39.7	1.55	55 59.1	1.69	17 13.2	2.25	20.6
31	15 22.6	15 28.8	56 20.2	1.83	56 43.0	1.96	18 6.8	2.21	21.6
32	15 35.4	15 42.4	57 7.2	+ 2.07	57 32.7	+ 2.16	18 59.3	2.16	22.6

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 1.					SUNDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	17 30 48.97	2.2306	S. 25 24 1.2	4.035	0	19 21 46.49	2.3679	S. 26 3 47.1	2.583
1	17 33 2.93	2.2348	25 27 59.6	3.912	1	19 24 8.60	2.3691	26 1 7.6	2.732
2	17 35 17.14	2.2389	25 31 50.6	3.788	2	19 26 30.78	2.3702	25 58 19.3	2.880
3	17 37 31.60	2.2430	25 35 34.2	3.663	3	19 28 53.02	2.3711	25 55 22.0	3.028
4	17 39 46.30	2.2471	25 39 10.2	3.538	4	19 31 15.31	2.3720	25 52 15.9	3.177
5	17 42 1.25	2.2512	25 42 38.7	3.412	5	19 33 37.66	2.3728	25 49 0.8	3.326
6	17 44 16.44	2.2552	25 45 59.6	3.284	6	19 36 0.05	2.3736	25 45 36.8	3.474
7	17 46 31.87	2.2591	25 49 12.8	3.156	7	19 38 22.49	2.3743	25 42 3.9	3.623
8	17 48 47.53	2.2629	25 52 18.3	3.028	8	19 40 44.97	2.3749	25 38 22.0	3.773
9	17 51 3.42	2.2668	25 55 16.1	2.898	9	19 43 7.48	2.3754	25 34 31.2	3.921
10	17 53 19.55	2.2707	25 58 6.1	2.768	10	19 45 30.02	2.3758	25 30 31.5	4.070
11	17 55 35.90	2.2743	26 0 48.3	2.638	11	19 47 52.58	2.3763	25 26 22.8	4.219
12	17 57 52.47	2.2780	26 3 22.7	2.507	12	19 50 15.17	2.3766	25 22 5.2	4.368
13	18 0 9.26	2.2817	26 5 49.1	2.374	13	19 52 37.77	2.3768	25 17 38.7	4.517
14	18 2 26.27	2.2853	26 8 7.6	2.242	14	19 55 0.38	2.3769	25 13 3.2	4.666
15	18 4 43.50	2.2889	26 10 18.1	2.108	15	19 57 23.00	2.3770	25 8 18.8	4.814
16	18 7 0.94	2.2923	26 12 20.6	1.975	16	19 59 45.62	2.3770	25 3 25.5	4.963
17	18 9 18.58	2.2957	26 14 15.1	1.840	17	20 2 8.24	2.3770	24 58 23.2	5.112
18	18 11 36.42	2.2991	26 16 1.4	1.704	18	20 4 30.86	2.3769	24 53 12.1	5.260
19	18 13 54.47	2.3024	26 17 39.6	1.569	19	20 6 53.47	2.3767	24 47 52.0	5.409
20	18 16 12.71	2.3056	26 19 9.7	1.432	20	20 9 16.06	2.3764	24 42 23.0	5.557
21	18 18 31.14	2.3088	26 20 31.5	1.294	21	20 11 38.64	2.3762	24 36 45.2	5.704
22	18 20 49.76	2.3119	26 21 45.0	1.157	22	20 14 1.20	2.3758	24 30 58.5	5.852
23	18 23 8.57	2.3150	S. 26 22 50.3	1.019	23	20 16 23.73	2.3753	S. 24 25 3.0	5.999
SATURDAY 2.					MONDAY 4.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	18 25 27.56	2.3179	S. 26 23 47.3	0.880	0	20 18 46.23	2.3748	S. 24 18 58.6	6.147
1	18 27 46.72	2.3208	26 24 35.9	0.741	1	20 21 8.70	2.3742	24 12 45.4	6.294
2	18 30 6.06	2.3237	26 25 16.2	0.602	2	20 23 31.13	2.3735	24 6 23.3	6.441
3	18 32 25.56	2.3264	26 25 48.1	0.461	3	20 25 53.52	2.3728	23 59 52.5	6.587
4	18 34 45.23	2.3292	26 26 11.5	0.319	4	20 28 15.87	2.3721	23 53 12.9	6.733
5	18 37 5.06	2.3318	26 26 26.4	0.178	5	20 30 38.17	2.3713	23 46 24.5	6.879
6	18 39 25.04	2.3343	26 26 32.8	-0.036	6	20 33 0.42	2.3703	23 39 27.4	7.024
7	18 41 45.18	2.3369	26 26 30.7	+0.107	7	20 35 22.61	2.3694	23 32 21.6	7.169
8	18 44 5.47	2.3393	26 26 20.0	0.249	8	20 37 44.75	2.3685	23 25 7.1	7.313
9	18 46 25.90	2.3417	26 26 0.8	0.392	9	20 40 6.83	2.3674	23 17 44.0	7.458
10	18 48 46.47	2.3439	26 25 33.0	0.536	10	20 42 28.84	2.3663	23 10 12.2	7.602
11	18 51 7.17	2.3461	26 24 56.5	0.680	11	20 44 50.79	2.3652	23 2 31.8	7.745
12	18 53 28.00	2.3483	26 24 11.4	0.824	12	20 47 12.66	2.3640	22 54 42.8	7.888
13	18 55 48.96	2.3503	26 23 17.6	0.969	13	20 49 34.47	2.3628	22 46 45.3	8.030
14	18 58 10.04	2.3523	26 22 15.1	1.114	14	20 51 56.20	2.3615	22 38 39.2	8.172
15	19 0 31.23	2.3542	26 21 3.9	1.260	15	20 54 17.85	2.3602	22 30 24.7	8.313
16	19 2 52.54	2.3560	26 19 43.9	1.407	16	20 56 39.42	2.3588	22 22 1.7	8.454
17	19 5 13.95	2.3578	26 18 15.1	1.553	17	20 59 0.90	2.3573	22 13 30.2	8.594
18	19 7 35.47	2.3595	26 16 37.6	1.698	18	21 1 22.30	2.3560	22 4 50.4	8.733
19	19 9 57.09	2.3611	26 14 51.3	1.846	19	21 3 43.62	2.3545	21 56 2.2	8.873
20	19 12 18.80	2.3626	26 12 56.1	1.993	20	21 6 4.84	2.3529	21 47 5.7	9.011
21	19 14 40.60	2.3641	26 10 52.1	2.140	21	21 8 25.97	2.3514	21 38 0.9	9.148
22	19 17 2.49	2.3654	26 8 39.3	2.288	22	21 10 47.01	2.3498	21 28 47.9	9.286
23	19 19 24.45	2.3667	26 6 17.6	2.435	23	21 13 7.95	2.3482	21 19 26.6	9.423
24	19 21 46.49	2.3679	S. 26 3 47.1	2.583	24	21 15 28.79	2.3465	S. 21 9 57.2	9.558

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 5.					THURSDAY 7.				
0	21 15 28.79	2.3465	S. 21 9 57.2	9.558	0	23 6 1.90	2.2634	S. 11 12 16.1	14.916
1	21 17 49.53	2.3448	21 0 19.7	9.693	1	23 8 17.67	2.2683	10 57 18.7	14.997
2	21 20 10.17	2.3432	20 50 34.1	9.827	2	23 10 33.37	2.2611	10 42 16.5	15.076
3	21 22 30.71	2.3414	20 40 40.5	9.960	3	23 12 49.00	2.2599	10 27 9.6	15.154
4	21 24 51.14	2.3397	20 30 38.9	10.093	4	23 15 4.56	2.2588	10 11 58.0	15.231
5	21 27 11.47	2.3379	20 20 29.3	10.226	5	23 17 20.06	2.2578	9 56 41.9	15.306
6	21 29 31.69	2.3361	20 10 11.8	10.357	6	23 19 35.50	2.2568	9 41 21.3	15.379
7	21 31 51.80	2.3343	19 59 46.5	10.487	7	23 21 50.88	2.2559	9 25 56.4	15.451
8	21 34 11.81	2.3326	19 49 13.4	10.616	8	23 24 6.21	2.2551	9 10 27.2	15.522
9	21 36 31.71	2.3307	19 38 32.6	10.744	9	23 26 21.49	2.2543	8 54 53.8	15.590
10	21 38 51.49	2.3288	19 27 44.1	10.872	10	23 28 36.72	2.2535	8 39 16.4	15.657
11	21 41 11.16	2.3269	19 16 47.9	10.999	11	23 30 51.91	2.2528	8 23 35.0	15.723
12	21 43 30.72	2.3250	19 5 44.2	11.125	12	23 33 7.05	2.2520	8 7 49.7	15.786
13	21 45 50.16	2.3231	18 54 32.9	11.250	13	23 35 22.15	2.2514	7 52 0.7	15.848
14	21 48 9.49	2.3213	18 43 14.2	11.374	14	23 37 37.22	2.2508	7 36 8.0	15.908
15	21 50 28.71	2.3193	18 31 48.0	11.498	15	23 39 52.25	2.2503	7 20 11.7	15.967
16	21 52 47.81	2.3174	18 20 14.5	11.619	16	23 42 7.26	2.2499	7 4 12.0	16.023
17	21 55 6.80	2.3155	18 8 33.7	11.740	17	23 44 22.24	2.2495	6 48 8.9	16.079
18	21 57 25.67	2.3136	17 56 45.7	11.860	18	23 46 37.20	2.2492	6 32 2.5	16.133
19	21 59 44.43	2.3117	17 44 50.5	11.979	19	23 48 52.14	2.2488	6 15 52.9	16.185
20	22 2 3.07	2.3098	17 32 48.2	12.098	20	23 51 7.06	2.2486	5 59 40.3	16.235
21	22 4 21.60	2.3079	17 20 38.8	12.215	21	23 53 21.97	2.2484	5 43 24.7	16.284
22	22 6 40.02	2.3061	17 8 22.4	12.331	22	23 55 36.87	2.2483	5 27 6.2	16.331
23	22 8 58.33	2.3042	S. 16 55 59.1	12.446	23	23 57 51.77	2.2483	S. 5 10 45.0	16.376
WEDNESDAY 6.					FRIDAY 8.				
0	22 11 16.52	2.3023	S. 16 43 28.9	12.559	0	0 0 6.67	2.2483	S. 4 54 21.1	16.419
1	22 13 34.60	2.3003	16 30 52.0	12.672	1	0 2 21.57	2.2484	4 37 54.7	16.460
2	22 15 52.56	2.2984	16 18 8.3	12.783	2	0 4 36.48	2.2485	4 21 25.9	16.499
3	22 18 10.41	2.2967	16 5 18.0	12.893	3	0 6 51.39	2.2487	4 4 54.8	16.537
4	22 20 28.16	2.2948	15 52 21.1	13.003	4	0 9 6.32	2.2490	3 48 21.4	16.574
5	22 22 45.79	2.2929	15 39 17.7	13.111	5	0 11 21.27	2.2493	3 31 45.9	16.608
6	22 25 3.31	2.2912	15 26 7.8	13.218	6	0 13 36.24	2.2497	3 15 8.5	16.639
7	22 27 20.73	2.2894	15 12 51.6	13.323	7	0 15 51.23	2.2501	2 58 29.2	16.670
8	22 29 38.04	2.2877	14 59 29.1	13.428	8	0 18 6.25	2.2507	2 41 48.1	16.698
9	22 31 55.25	2.2860	14 46 0.3	13.531	9	0 20 21.31	2.2512	2 25 5.4	16.725
10	22 34 12.36	2.2843	14 32 25.4	13.633	10	0 22 36.40	2.2518	2 8 21.1	16.751
11	22 36 29.36	2.2825	14 18 44.4	13.733	11	0 24 51.53	2.2526	1 51 35.3	16.773
12	22 38 46.26	2.2808	14 4 57.5	13.832	12	0 27 6.71	2.2534	1 34 48.3	16.793
13	22 41 3.06	2.2793	13 51 4.6	13.930	13	0 29 21.94	2.2543	1 18 0.1	16.813
14	22 43 19.77	2.2777	13 37 5.9	14.026	14	0 31 37.22	2.2551	1 1 10.7	16.831
15	22 45 36.38	2.2760	13 23 1.5	14.121	15	0 33 52.55	2.2561	0 44 20.4	16.846
16	22 47 52.89	2.2745	13 8 51.4	14.215	16	0 36 7.95	2.2572	0 27 29.2	16.859
17	22 50 9.32	2.2730	12 54 35.7	14.308	17	0 38 23.41	2.2583	S. 0 10 37.3	16.870
18	22 52 25.65	2.2715	12 40 14.5	14.399	18	0 40 38.94	2.2594	N. 0 6 15.2	16.880
19	22 54 41.90	2.2701	12 25 47.8	14.489	19	0 42 54.54	2.2607	0 23 8.3	16.888
20	22 56 58.06	2.2687	12 11 15.8	14.578	20	0 45 10.22	2.2620	0 40 1.7	16.893
21	22 59 14.14	2.2673	11 56 38.5	14.664	21	0 47 25.98	2.2634	0 56 55.4	16.896
22	23 1 30.14	2.2660	11 41 56.1	14.749	22	0 49 41.83	2.2648	1 13 49.2	16.898
23	23 3 46.06	2.2647	11 27 8.6	14.833	23	0 51 57.76	2.2663	1 30 43.1	16.898
24	23 6 1.90	2.2634	S. 11 12 16.1	14.916	24	0 54 13.78	2.2678	N. 1 47 36.9	16.895

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 9.					MONDAY 11.				
0	0 54 13.78	2.2678	N. 1 47 36.9	16.895	0	2 46 2.48	2.4102	N. 14 37 3.2	14.383
1	0 56 29.90	2.2695	2 4 30.5	16.891	1	2 48 27.21	2.4142	14 51 23.2	14.282
2	0 58 46.12	2.2713	2 21 23.8	16.884	2	2 50 52.18	2.4181	15 5 37.0	14.178
3	1 1 2.45	2.2730	2 38 16.6	16.875	3	2 53 17.38	2.4221	15 19 44.5	14.073
4	1 3 18.88	2.2748	2 55 8.8	16.865	4	2 55 42.83	2.4261	15 33 45.7	13.966
5	1 5 35.42	2.2767	3 12 0.4	16.853	5	2 58 8.51	2.4300	15 47 40.4	13.857
6	1 7 52.08	2.2787	3 28 51.2	16.838	6	3 0 34.43	2.4340	16 1 28.5	13.747
7	1 10 8.86	2.2807	3 45 41.0	16.821	7	3 3 0.59	2.4380	16 15 10.0	13.634
8	1 12 25.76	2.2828	4 2 29.7	16.803	8	3 5 26.99	2.4420	16 28 44.6	13.519
9	1 14 42.79	2.2849	4 19 17.3	16.783	9	3 7 53.63	2.4460	16 42 12.3	13.403
10	1 16 59.95	2.2872	4 36 3.6	16.760	10	3 10 20.51	2.4500	16 55 33.0	13.286
11	1 19 17.25	2.2895	4 52 48.5	16.735	11	3 12 47.63	2.4540	17 8 46.6	13.166
12	1 21 34.69	2.2918	5 9 31.8	16.708	12	3 15 14.99	2.4580	17 21 52.9	13.044
13	1 23 52.27	2.2942	5 26 13.4	16.679	13	3 17 42.59	2.4620	17 34 51.9	12.922
14	1 26 9.99	2.2967	5 42 53.3	16.649	14	3 20 10.43	2.4659	17 47 43.5	12.797
15	1 28 27.87	2.2993	5 59 31.3	16.616	15	3 22 38.50	2.4698	18 0 27.5	12.670
16	1 30 45.90	2.3018	6 16 7.2	16.581	16	3 25 6.81	2.4738	18 13 3.9	12.542
17	1 33 4.09	2.3044	6 32 41.0	16.543	17	3 27 35.36	2.4778	18 25 32.5	12.412
18	1 35 22.43	2.3071	6 49 12.4	16.503	18	3 30 4.14	2.4816	18 37 53.3	12.281
19	1 37 40.94	2.3098	7 5 41.4	16.463	19	3 32 33.15	2.4854	18 50 6.2	12.148
20	1 39 59.61	2.3127	7 22 7.9	16.420	20	3 35 2.39	2.4893	19 2 11.1	12.013
21	1 42 18.46	2.3156	7 38 31.8	16.375	21	3 37 31.86	2.4931	19 14 7.8	11.877
22	1 44 37.48	2.3185	7 54 52.9	16.328	22	3 40 1.56	2.4968	19 25 56.3	11.739
23	1 46 56.68	2.3215	N. 8 11 11.1	16.278	23	3 42 31.48	2.5006	N. 19 37 36.5	11.601
SUNDAY 10.					TUESDAY 12.				
0	1 49 16.06	2.3245	N. 8 27 26.2	16.226	0	3 45 1.63	2.5043	N. 19 49 8.3	11.460
1	1 51 35.62	2.3276	8 43 38.2	16.173	1	3 47 32.00	2.5080	20 0 31.7	11.318
2	1 53 55.37	2.3308	8 59 46.9	16.117	2	3 50 2.59	2.5116	20 11 46.5	11.174
3	1 56 15.31	2.3339	9 15 52.2	16.059	3	3 52 33.39	2.5152	20 22 52.6	11.029
4	1 58 35.44	2.3371	9 31 54.0	15.999	4	3 55 4.41	2.5188	20 33 50.0	10.883
5	2 0 55.76	2.3404	9 47 52.1	15.938	5	3 57 35.64	2.5222	20 44 38.6	10.736
6	2 3 16.28	2.3438	10 3 46.5	15.874	6	4 0 7.07	2.5256	20 55 18.3	10.587
7	2 5 37.01	2.3471	10 19 37.0	15.808	7	4 2 38.71	2.5290	21 5 49.0	10.436
8	2 7 57.94	2.3506	10 35 23.5	15.740	8	4 5 10.55	2.5323	21 16 10.6	10.284
9	2 10 19.08	2.3541	10 51 5.8	15.670	9	4 7 42.58	2.5355	21 26 23.1	10.132
10	2 12 40.43	2.3576	11 6 43.9	15.598	10	4 10 14.81	2.5387	21 36 26.4	9.978
11	2 15 1.99	2.3611	11 22 17.6	15.524	11	4 12 47.23	2.5418	21 46 20.4	9.823
12	2 17 23.76	2.3647	11 37 46.8	15.448	12	4 15 19.83	2.5448	21 56 5.1	9.667
13	2 19 45.75	2.3683	11 53 11.4	15.371	13	4 17 52.61	2.5478	22 5 40.4	9.508
14	2 22 7.96	2.3720	12 8 31.3	15.291	14	4 20 25.57	2.5508	22 15 6.1	9.349
15	2 24 30.39	2.3757	12 23 46.3	15.208	15	4 22 58.71	2.5537	22 24 22.3	9.189
16	2 26 53.04	2.3793	12 38 56.3	15.125	16	4 25 32.01	2.5563	22 33 28.8	9.028
17	2 29 15.91	2.3831	12 54 1.3	15.039	17	4 28 5.47	2.5590	22 42 25.7	8.867
18	2 31 39.01	2.3870	13 9 1.0	14.951	18	4 30 39.09	2.5617	22 51 12.8	8.703
19	2 34 2.35	2.3908	13 23 55.4	14.861	19	4 33 12.87	2.5642	22 59 50.1	8.540
20	2 36 25.91	2.3946	13 38 44.3	14.769	20	4 35 46.79	2.5666	23 8 17.6	8.375
21	2 38 49.70	2.3985	13 53 27.7	14.676	21	4 38 20.86	2.5689	23 16 35.1	8.209
22	2 41 13.73	2.4024	14 8 5.4	14.579	22	4 40 55.06	2.5711	23 24 42.7	8.043
23	2 43 37.99	2.4063	14 22 37.2	14.482	23	4 43 29.39	2.5733	23 32 40.2	7.875
24	2 46 2.48	2.4102	N. 14 37 3.2	14.383	24	4 46 3.85	2.5753	N. 23 40 27.7	7.708



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 13.					FRIDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	4 46 3.85	2.5753	N.23 40 27.7	7.708	0	6 49 50.03	2.5339	N.26 29 29.1	0.647
1	4 48 38.43	2.5773	23 48 5.1	7.538	1	6 52 21.95	2.5301	26 28 45.3	0.813
2	4 51 13.12	2.5791	23 55 32.3	7.368	2	6 54 53.64	2.5261	26 27 51.5	0.979
3	4 53 47.92	2.5808	24 2 49.3	7.198	3	6 57 25.08	2.5219	26 26 47.8	1.144
4	4 56 22.82	2.5825	24 9 56.0	7.027	4	6 59 56.27	2.5178	26 25 34.2	1.308
5	4 58 57.82	2.5840	24 16 52.5	6.855	5	7 2 27.21	2.5135	26 24 10.8	1.471
6	5 1 32.90	2.5853	24 23 38.6	6.682	6	7 4 57.89	2.5091	26 22 37.7	1.633
7	5 4 8.06	2.5867	24 30 14.3	6.509	7	7 7 28.30	2.5046	26 20 54.8	1.795
8	5 6 43.30	2.5879	24 36 39.7	6.337	8	7 9 58.44	2.4999	26 19 2.3	1.955
9	5 9 18.61	2.5890	24 42 54.7	6.163	9	7 12 28.29	2.4952	26 17 0.2	2.114
10	5 11 53.98	2.5900	24 48 59.2	5.988	10	7 14 57.86	2.4904	26 14 48.6	2.273
11	5 14 29.41	2.5909	24 54 53.2	5.813	11	7 17 27.14	2.4856	26 12 27.5	2.431
12	5 17 4.89	2.5917	25 0 36.7	5.638	12	7 19 56.13	2.4806	26 9 56.9	2.588
13	5 19 40.41	2.5923	25 6 9.7	5.462	13	7 22 24.81	2.4755	26 7 17.0	2.743
14	5 22 15.96	2.5927	25 11 32.1	5.286	14	7 24 53.19	2.4703	26 4 27.8	2.898
15	5 24 51.53	2.5930	25 16 44.0	5.110	15	7 27 21.25	2.4651	26 1 29.3	3.051
16	5 27 27.12	2.5933	25 21 45.3	4.933	16	7 29 49.00	2.4598	25 58 21.7	3.203
17	5 30 2.72	2.5934	25 26 36.0	4.757	17	7 32 16.43	2.4544	25 55 5.0	3.354
18	5 32 38.33	2.5934	25 31 16.1	4.580	18	7 34 43.53	2.4489	25 51 39.2	3.504
19	5 35 13.93	2.5933	25 35 45.6	4.403	19	7 37 10.30	2.4434	25 48 4.5	3.653
20	5 37 49.52	2.5930	25 40 4.5	4.226	20	7 39 36.74	2.4378	25 44 20.8	3.802
21	5 40 25.09	2.5927	25 44 12.7	4.048	21	7 42 2.83	2.4321	25 40 28.3	3.948
22	5 43 0.64	2.5922	25 48 10.3	3.871	22	7 44 28.59	2.4264	25 36 27.0	4.094
23	5 45 36.15	2.5915	N.25 51 57.2	3.693	23	7 46 54.00	2.4205	N.25 32 17.0	4.239
THURSDAY 14.					SATURDAY 16.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	5 48 11.62	2.5908	N.25 55 33.5	3.517	0	7 49 19.05	2.4146	N.25 27 58.3	4.383
1	5 50 47.04	2.5898	25 58 59.2	3.339	1	7 51 43.75	2.4088	25 23 31.1	4.524
2	5 53 22.40	2.5888	26 2 14.2	3.162	2	7 54 8.10	2.4028	25 18 55.4	4.665
3	5 55 57.69	2.5875	26 5 18.6	2.985	3	7 56 32.09	2.3968	25 14 11.3	4.805
4	5 58 32.90	2.5863	26 8 12.4	2.808	4	7 58 55.71	2.3906	25 9 18.8	4.944
5	6 1 8.04	2.5849	26 10 55.6	2.633	5	8 1 18.96	2.3845	25 4 18.0	5.081
6	6 3 43.09	2.5833	26 13 28.3	2.456	6	8 3 41.85	2.3783	24 59 9.1	5.217
7	6 6 18.04	2.5817	26 15 50.3	2.279	7	8 6 4.36	2.3720	24 53 52.0	5.353
8	6 8 52.89	2.5798	26 18 1.8	2.103	8	8 8 26.49	2.3658	24 48 26.8	5.486
9	6 11 27.62	2.5779	26 20 2.7	1.928	9	8 10 48.25	2.3595	24 42 53.7	5.618
10	6 14 2.24	2.5759	26 21 53.1	1.753	10	8 13 9.63	2.3532	24 37 12.7	5.749
11	6 16 36.73	2.5737	26 23 33.0	1.578	11	8 15 30.63	2.3468	24 31 23.8	5.879
12	6 19 11.08	2.5713	26 25 2.4	1.403	12	8 17 51.24	2.3403	24 25 27.2	6.008
13	6 21 45.29	2.5689	26 26 21.4	1.229	13	8 20 11.47	2.3339	24 19 22.9	6.135
14	6 24 19.35	2.5663	26 27 29.9	1.055	14	8 22 31.31	2.3274	24 13 11.0	6.262
15	6 26 53.25	2.5636	26 28 28.0	0.883	15	8 24 50.76	2.3209	24 6 51.5	6.387
16	6 29 26.98	2.5608	26 29 15.8	0.710	16	8 27 9.82	2.3144	24 0 24.6	6.509
17	6 32 0.54	2.5578	26 29 53.2	0.538	17	8 29 28.49	2.3078	23 53 50.4	6.632
18	6 34 33.92	2.5548	26 30 20.4	0.368	18	8 31 46.76	2.3013	23 47 8.8	6.753
19	6 37 7.11	2.5516	26 30 37.3	0.196	19	8 34 4.65	2.2948	23 40 20.0	6.873
20	6 39 40.11	2.5483	26 30 43.9	+0.026	20	8 36 22.14	2.2882	23 33 24.1	6.991
21	6 42 12.91	2.5449	26 30 40.4	-0.143	21	8 38 39.23	2.2816	23 26 21.1	7.108
22	6 44 45.50	2.5414	26 30 26.7	0.313	22	8 40 55.93	2.2750	23 19 11.1	7.224
23	6 47 17.88	2.5377	26 30 2.9	0.480	23	8 43 12.23	2.2683	23 11 54.2	7.339
24	6 49 50.03	2.5339	N.26 29 29.1	0.647	24	8 45 28.13	2.2618	N.23 4 30.4	7.453

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 17.					TUESDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 45 28.13	2.2618	N.23 4 30.4	7.453	0	10 26 45.07	1.9718	N.15 19 35.6	11.478
1	8 47 43.64	2.2552	22 56 59.8	7.565	1	10 28 43.23	1.9668	15 8 5.6	11.528
2	8 49 58.75	2.2485	22 49 22.6	7.675	2	10 30 41.09	1.9619	14 56 32.3	11.583
3	8 52 13.46	2.2419	22 41 38.8	7.785	3	10 32 38.66	1.9571	14 44 55.7	11.638
4	8 54 27.78	2.2353	22 33 48.4	7.893	4	10 34 35.94	1.9523	14 33 15.8	11.691
5	8 56 41.70	2.2287	22 25 51.6	8.000	5	10 36 32.94	1.9476	14 21 32.8	11.743
6	8 58 55.22	2.2221	22 17 48.4	8.106	6	10 38 29.65	1.9429	14 9 46.6	11.795
7	9 1 8.35	2.2155	22 9 38.9	8.210	7	10 40 26.09	1.9383	13 57 57.4	11.845
8	9 3 21.08	2.2089	22 1 23.2	8.313	8	10 42 22.25	1.9338	13 46 5.2	11.895
9	9 5 33.42	2.2024	21 53 1.3	8.416	9	10 44 18.14	1.9293	13 34 10.0	11.943
10	9 7 45.87	2.1958	21 44 33.3	8.517	10	10 46 13.76	1.9248	13 22 12.0	11.991
11	9 9 56.92	2.1893	21 35 59.3	8.616	11	10 48 9.12	1.9205	13 10 11.1	12.038
12	9 12 8.08	2.1828	21 27 19.4	8.714	12	10 50 4.22	1.9162	12 58 7.4	12.084
13	9 14 18.85	2.1763	21 18 33.6	8.811	13	10 51 59.06	1.9119	12 46 1.0	12.128
14	9 16 29.23	2.1698	21 9 42.1	8.906	14	10 53 53.65	1.9077	12 33 52.0	12.173
15	9 18 39.22	2.1633	21 0 44.9	9.001	15	10 55 47.99	1.9037	12 21 40.3	12.216
16	9 20 48.83	2.1568	20 51 42.0	9.095	16	10 57 42.09	1.8996	12 9 26.1	12.258
17	9 22 58.05	2.1505	20 42 33.5	9.187	17	10 59 35.94	1.8956	11 57 9.4	12.299
18	9 25 6.89	2.1442	20 33 19.6	9.277	18	11 1 29.56	1.8917	11 44 50.2	12.340
19	9 27 15.35	2.1378	20 24 0.3	9.367	19	11 3 22.94	1.8878	11 32 28.6	12.379
20	9 29 23.43	2.1315	20 14 35.6	9.456	20	11 5 16.09	1.8839	11 20 4.7	12.418
21	9 31 31.13	2.1253	20 5 5.6	9.543	21	11 7 9.01	1.8802	11 7 38.5	12.455
22	9 33 38.46	2.1190	19 55 30.4	9.629	22	11 9 1.71	1.8766	10 55 10.1	12.492
23	9 35 45.41	2.1128	N.19 45 50.1	9.713	23	11 10 54.20	1.8730	N.10 42 39.5	12.528
MONDAY 18.					WEDNESDAY 20.				
0	9 37 51.99	2.1066	N.19 36 4.8	9.797	0	11 12 46.47	1.8694	N.10 30 6.8	12.563
1	9 39 58.20	2.1004	19 26 14.5	9.880	1	11 14 38.53	1.8659	10 17 32.0	12.597
2	9 42 4.04	2.0943	19 16 19.2	9.962	2	11 16 30.38	1.8625	10 4 55.2	12.630
3	9 44 9.52	2.0883	19 6 19.1	10.043	3	11 18 22.03	1.8592	9 52 16.4	12.662
4	9 46 14.64	2.0823	18 56 14.2	10.121	4	11 20 13.48	1.8559	9 39 35.7	12.694
5	9 48 19.40	2.0763	18 46 4.6	10.199	5	11 22 4.74	1.8527	9 26 53.1	12.725
6	9 50 23.80	2.0703	18 35 50.3	10.276	6	11 23 55.80	1.8495	9 14 8.7	12.755
7	9 52 27.84	2.0644	18 25 31.5	10.351	7	11 25 46.68	1.8464	9 1 22.5	12.784
8	9 54 31.53	2.0586	18 15 8.2	10.426	8	11 27 37.37	1.8433	8 48 34.6	12.812
9	9 56 34.87	2.0528	18 4 40.4	10.499	9	11 29 27.88	1.8404	8 35 45.1	12.839
10	9 58 37.87	2.0471	17 54 8.3	10.572	10	11 31 18.22	1.8375	8 22 53.9	12.866
11	10 0 40.52	2.0413	17 43 31.8	10.643	11	11 33 8.38	1.8347	8 10 1.2	12.892
12	10 2 42.83	2.0357	17 32 51.1	10.713	12	11 34 58.38	1.8320	7 57 6.9	12.917
13	10 4 44.80	2.0301	17 22 6.2	10.782	13	11 36 48.22	1.8293	7 44 11.2	12.941
14	10 6 46.44	2.0245	17 11 17.3	10.849	14	11 38 37.89	1.8266	7 31 14.0	12.964
15	10 8 47.74	2.0190	17 0 24.3	10.917	15	11 40 27.41	1.8241	7 18 15.5	12.987
16	10 10 48.72	2.0136	16 49 27.3	10.983	16	11 42 16.78	1.8216	7 5 15.6	13.009
17	10 12 49.37	2.0082	16 38 26.4	11.048	17	11 44 6.00	1.8191	6 52 14.4	13.030
18	10 14 49.70	2.0028	16 27 21.6	11.111	18	11 45 55.07	1.8167	6 39 12.0	13.050
19	10 16 49.71	1.9975	16 16 13.1	11.173	19	11 47 44.00	1.8144	6 26 8.4	13.069
20	10 18 49.40	1.9923	16 5 0.8	11.236	20	11 49 32.80	1.8122	6 13 3.7	13.088
21	10 20 48.78	1.9871	15 53 44.8	11.296	21	11 51 21.46	1.8099	5 59 57.9	13.105
22	10 22 47.85	1.9819	15 42 25.3	11.355	22	11 53 9.99	1.8078	5 46 51.1	13.123
23	10 24 46.61	1.9768	15 31 2.2	11.414	23	11 54 58.40	1.8058	5 33 43.2	13.139
24	10 26 45.07	1.9718	N.15 19 35.6	11.472	24	11 56 46.69	1.8038	N. 5 20 34.4	13.154

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 21.					SATURDAY 23.				
0	11 56 46.69	1.8038	N. 5 20 34.4	13.154	0	13 22 17.20	1.7829	S. 5 14 32.1	13.087
1	11 58 34.86	1.8019	5 7 24.7	13.169	1	13 24 4.21	1.7840	5 27 33.1	13.006
2	12 0 22.92	1.8001	4 54 14.1	13.183	2	13 25 51.28	1.7851	5 40 32.8	12.984
3	12 2 10.87	1.7983	4 41 2.7	13.197	3	13 27 38.42	1.7863	5 53 31.2	12.963
4	12 3 58.71	1.7965	4 27 50.5	13.209	4	13 29 25.64	1.7876	6 6 28.3	12.940
5	12 5 46.45	1.7949	4 14 37.6	13.221	5	13 31 12.93	1.7888	6 19 24.0	12.916
6	12 7 34.10	1.7933	4 1 24.0	13.232	6	13 33 0.30	1.7902	6 32 18.2	12.892
7	12 9 21.65	1.7918	3 48 9.8	13.242	7	13 34 47.75	1.7916	6 45 11.0	12.867
8	12 11 9.11	1.7903	3 34 55.0	13.251	8	13 36 35.29	1.7931	6 58 2.2	12.841
9	12 12 56.48	1.7888	3 21 39.7	13.260	9	13 38 22.92	1.7946	7 10 51.9	12.814
10	12 14 43.77	1.7875	3 8 23.8	13.268	10	13 40 10.64	1.7962	7 23 39.9	12.787
11	12 16 30.98	1.7863	2 55 7.5	13.275	11	13 41 58.46	1.7978	7 36 26.3	12.759
12	12 18 18.12	1.7851	2 41 50.8	13.282	12	13 43 46.38	1.7995	7 49 11.0	12.730
13	12 20 5.19	1.7839	2 28 33.7	13.288	13	13 45 34.40	1.8013	8 1 53.9	12.701
14	12 21 52.19	1.7828	2 15 16.3	13.293	14	13 47 22.53	1.8030	8 14 35.1	12.671
15	12 23 39.13	1.7818	2 1 58.6	13.297	15	13 49 10.76	1.8048	8 27 14.4	12.639
16	12 25 26.01	1.7808	1 48 40.7	13.300	16	13 50 59.11	1.8068	8 39 51.8	12.608
17	12 27 12.83	1.7799	1 35 22.6	13.303	17	13 52 47.57	1.8087	8 52 27.3	12.575
18	12 28 59.60	1.7791	1 22 4.4	13.304	18	13 54 36.15	1.8108	9 5 0.8	12.542
19	12 30 46.32	1.7783	1 8 46.1	13.306	19	13 56 24.86	1.8128	9 17 32.3	12.508
20	12 32 33.00	1.7777	0 55 27.7	13.307	20	13 58 13.69	1.8149	9 30 1.7	12.473
21	12 34 19.64	1.7770	0 42 9.3	13.307	21	14 0 2.65	1.8171	9 42 29.0	12.437
22	12 36 6.24	1.7764	0 28 50.9	13.306	22	14 1 51.74	1.8193	9 54 54.1	12.400
23	12 37 52.81	1.7759	N. 0 15 32.6	13.304	23	14 3 40.97	1.8217	S. 10 7 17.0	12.363
FRIDAY 22.					SUNDAY 24.				
0	12 39 39.35	1.7755	N. 0 2 14.4	13.302	0	14 5 30.34	1.8240	S. 10 19 37.7	12.326
1	12 41 25.87	1.7751	S. 0 11 3.6	13.298	1	14 7 19.85	1.8263	10 31 56.1	12.287
2	12 43 12.36	1.7748	0 20 21.4	13.295	2	14 9 9.50	1.8288	10 44 12.1	12.247
3	12 44 58.84	1.7745	0 37 39.0	13.291	3	14 10 59.30	1.8313	10 56 25.7	12.207
4	12 46 45.30	1.7743	0 50 56.3	13.285	4	14 12 49.25	1.8338	11 8 36.9	12.166
5	12 48 31.75	1.7741	1 4 13.2	13.278	5	14 14 39.36	1.8364	11 20 45.6	12.123
6	12 50 18.19	1.7740	1 17 29.7	13.272	6	14 16 29.62	1.8390	11 32 51.7	12.081
7	12 52 4.63	1.7740	1 30 45.8	13.264	7	14 18 20.04	1.8417	11 44 55.3	12.038
8	12 53 51.07	1.7741	1 44 1.4	13.256	8	14 20 10.62	1.8444	11 56 56.2	11.993
9	12 55 37.52	1.7742	1 57 16.5	13.248	9	14 22 1.37	1.8473	12 8 54.4	11.948
10	12 57 23.97	1.7743	2 10 31.1	13.238	10	14 23 52.29	1.8501	12 20 50.0	11.903
11	12 59 10.44	1.7746	2 23 45.1	13.228	11	14 25 43.38	1.8529	12 32 42.8	11.856
12	13 0 56.92	1.7748	2 36 58.4	13.216	12	14 27 34.64	1.8558	12 44 32.7	11.808
13	13 2 43.42	1.7752	2 50 11.0	13.204	13	14 29 26.08	1.8588	12 56 19.8	11.760
14	13 4 29.94	1.7756	3 3 22.9	13.192	14	14 31 17.70	1.8618	13 8 3.9	11.711
15	13 6 16.49	1.7761	3 16 34.1	13.179	15	14 33 9.50	1.8649	13 19 45.1	11.662
16	13 8 3.07	1.7766	3 29 44.4	13.165	16	14 35 1.49	1.8681	13 31 23.3	11.611
17	13 9 49.68	1.7772	3 42 53.9	13.150	17	14 36 53.67	1.8713	13 42 58.4	11.559
18	13 11 36.33	1.7778	3 56 2.4	13.134	18	14 38 46.04	1.8744	13 54 30.4	11.507
19	13 13 23.02	1.7785	4 9 10.0	13.118	19	14 40 38.60	1.8777	14 5 59.2	11.453
20	13 15 9.75	1.7793	4 22 16.6	13.101	20	14 42 31.36	1.8810	14 17 24.8	11.399
21	13 16 56.53	1.7802	4 35 22.1	13.083	21	14 44 24.32	1.8843	14 28 47.1	11.344
22	13 18 43.37	1.7811	4 48 26.6	13.065	22	14 46 17.48	1.8877	14 40 6.1	11.289
23	13 20 30.26	1.7819	5 1 29.9	13.046	23	14 48 10.84	1.8911	14 51 21.8	11.233
24	13 22 17.20	1.7829	S. 5 14 32.1	13.027	24	14 50 4.41	1.8946	S. 15 2 34.1	11.176

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 25.					WEDNESDAY 27.				
0	14 50 4.41	1.8946	S. 15 2 34.1	11.176	0	16 25 36.57	2.0943	S. 22 36 48.6	7.447
1	14 51 58.19	1.8981	15 13 42.9	11.118	1	16 27 42.36	2.0988	22 44 10.6	7.317
2	14 53 52.18	1.9016	15 24 48.2	11.059	2	16 29 48.42	2.1032	22 51 26.6	7.217
3	14 55 46.38	1.9052	15 35 50.0	10.999	3	16 31 54.74	2.1076	22 58 36.6	7.116
4	14 57 40.80	1.9088	15 46 48.1	10.938	4	16 34 1.33	2.1120	23 5 40.5	7.013
5	14 59 35.44	1.9124	15 57 42.6	10.877	5	16 36 8.18	2.1164	23 12 38.2	6.910
6	15 1 30.29	1.9161	16 8 33.4	10.815	6	16 38 15.30	2.1209	23 19 29.7	6.806
7	15 3 25.37	1.9199	16 19 20.4	10.752	7	16 40 22.69	2.1253	23 26 14.9	6.701
8	15 5 20.68	1.9237	16 30 3.6	10.688	8	16 42 30.34	2.1297	23 32 53.8	6.595
9	15 7 16.21	1.9274	16 40 42.9	10.623	9	16 44 38.25	2.1341	23 39 26.2	6.488
10	15 9 11.97	1.9313	16 51 18.3	10.558	10	16 46 46.43	2.1385	23 45 52.4	6.382
11	15 11 7.97	1.9353	17 1 49.8	10.491	11	16 48 54.87	2.1428	23 52 12.1	6.274
12	15 13 4.20	1.9391	17 12 17.2	10.423	12	16 51 3.57	2.1472	23 58 25.3	6.165
13	15 15 0.66	1.9430	17 22 40.6	10.355	13	16 53 12.53	2.1514	24 4 31.9	6.055
14	15 16 57.36	1.9470	17 32 59.8	10.286	14	16 55 21.74	2.1557	24 10 31.9	5.944
15	15 18 54.30	1.9510	17 43 14.9	10.216	15	16 57 31.21	2.1599	24 16 25.2	5.833
16	15 20 51.48	1.9550	17 53 25.7	10.145	16	16 59 40.93	2.1641	24 22 11.8	5.721
17	15 22 48.90	1.9591	18 3 32.3	10.073	17	17 1 50.90	2.1683	24 27 51.7	5.608
18	15 24 46.57	1.9633	18 13 34.5	10.001	18	17 4 1.13	2.1725	24 33 24.8	5.494
19	15 26 44.49	1.9673	18 23 32.4	9.928	19	17 6 11.60	2.1766	24 38 51.0	5.379
20	15 28 42.65	1.9714	18 33 25.8	9.853	20	17 8 22.32	2.1808	24 44 10.3	5.264
21	15 30 41.06	1.9756	18 43 14.7	9.778	21	17 10 33.29	2.1848	24 49 22.7	5.148
22	15 32 39.72	1.9798	18 52 59.1	9.702	22	17 12 44.50	2.1888	24 54 28.1	5.032
23	15 34 38.63	1.9840	S. 19 2 38.9	9.625	23	17 14 55.95	2.1928	S. 24 59 26.5	4.914
TUESDAY 26.					THURSDAY 28.				
0	15 36 37.80	1.9883	S. 19 12 14.1	9.547	0	17 17 7.64	2.1968	S. 25 4 17.8	4.796
1	15 38 37.22	1.9925	19 21 44.6	9.468	1	17 19 19.57	2.2008	25 9 2.0	4.677
2	15 40 36.90	1.9968	19 31 10.3	9.388	2	17 21 31.73	2.2046	25 13 39.0	4.557
3	15 42 36.84	2.0011	19 40 31.2	9.308	3	17 23 44.12	2.2085	25 18 8.8	4.436
4	15 44 37.03	2.0054	19 49 47.3	9.228	4	17 25 56.75	2.2123	25 22 31.3	4.314
5	15 46 37.49	2.0095	19 58 58.5	9.145	5	17 28 9.60	2.2160	25 26 46.5	4.193
6	15 48 38.21	2.0142	20 8 4.7	9.062	6	17 30 22.67	2.2198	25 30 54.4	4.070
7	15 50 39.19	2.0185	20 17 5.9	8.978	7	17 32 35.97	2.2234	25 34 54.9	3.947
8	15 52 40.43	2.0229	20 26 2.0	8.893	8	17 34 49.48	2.2270	25 38 48.0	3.823
9	15 54 41.94	2.0273	20 34 53.0	8.807	9	17 37 3.21	2.2306	25 42 33.6	3.698
10	15 56 43.71	2.0318	20 43 38.8	8.720	10	17 39 17.15	2.2342	25 46 11.7	3.573
11	15 58 45.75	2.0362	20 52 19.4	8.633	11	17 41 31.31	2.2377	25 49 42.3	3.446
12	16 0 48.05	2.0406	21 0 54.8	8.545	12	17 43 45.67	2.2411	25 53 5.2	3.318
13	16 2 50.62	2.0451	21 9 24.8	8.456	13	17 46 0.23	2.2444	25 56 20.5	3.192
14	16 4 53.46	2.0495	21 17 49.5	8.366	14	17 48 15.00	2.2478	25 59 28.2	3.064
15	16 6 56.56	2.0539	21 26 8.7	8.274	15	17 50 29.97	2.2511	26 2 28.2	2.935
16	16 8 59.93	2.0584	21 34 22.4	8.183	16	17 52 45.13	2.2543	26 5 20.4	2.805
17	16 11 3.57	2.0629	21 42 30.6	8.090	17	17 55 0.48	2.2573	26 8 4.8	2.676
18	16 13 7.48	2.0673	21 50 33.2	7.997	18	17 57 16.01	2.2604	26 10 41.5	2.546
19	16 15 11.65	2.0718	21 58 30.2	7.903	19	17 59 31.73	2.2635	26 13 10.3	2.414
20	16 17 16.10	2.0764	22 6 21.5	7.807	20	18 1 47.63	2.2664	26 15 31.2	2.283
21	16 19 20.82	2.0808	22 14 7.0	7.710	21	18 4 3.70	2.2693	26 17 44.2	2.151
22	16 21 25.80	2.0853	22 21 46.7	7.613	22	18 6 19.95	2.2722	26 19 49.3	2.018
23	16 23 31.05	2.0898	22 29 20.6	7.516	23	18 8 36.36	2.2749	26 21 46.4	1.885
24	16 25 36.57	2.0943	S. 22 36 48.6	7.417	24	18 10 52.94	2.2777	S. 26 23 35.5	1.752

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 29.					SUNDAY, MAY 1.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	18 10 52.94	2.2777	S. 26 23 35.5	1.752	20	1 58.76	2.3235	S. 25 7 16.4	4.989
2	18 13 9.68	2.2803	26 25 16.6	1.618	PHASES OF THE MOON.				
3	18 15 26.58	2.2829	26 26 49.6	1.483					
4	18 17 43.63	2.2854	26 28 14.5	1.348					
5	18 20 0.83	2.2878	26 29 31.3	1.212					
6	18 22 18.17	2.2902	26 30 39.9	1.076					
7	18 24 35.65	2.2925	26 31 40.4	0.939					
8	18 26 53.27	2.2948	26 32 32.6	0.802					
9	18 29 11.03	2.2970	26 33 16.6	0.665					
10	18 31 28.91	2.2990	26 33 52.4	0.528					
11	18 33 46.91	2.3010	26 34 19.9	0.389					
12	18 36 5.03	2.3030	26 34 39.1	0.251	☾ Last Quarter . . . . . Apr. 2 12 47.6 ● New Moon . . . . . 9 9 25.1 ☾ First Quarter . . . . . 16 2 4.0 ○ Full Moon . . . . . 24 1 22.7				
13	18 38 23.27	2.3049	26 34 50.0	-0.113					
14	18 40 41.62	2.3067	26 34 52.6	+0.027					
15	18 43 0.07	2.3084	26 34 46.8	0.167					
16	18 45 18.63	2.3101	26 34 32.6	0.307					
17	18 47 37.28	2.3117	26 34 10.0	0.447					
18	18 49 56.03	2.3132	26 33 39.0	0.587					
19	18 52 14.86	2.3146	26 32 59.6	0.728					
20	18 54 33.78	2.3160	26 32 11.7	0.868					
21	18 56 52.78	2.3173	26 31 15.4	1.009					
22	18 59 11.85	2.3184	26 30 10.6	1.151					
23	19 1 30.99	2.3196	26 28 57.3	1.292					
24	19 3 50.20	2.3206	S. 26 27 35.6	1.433					
SATURDAY 30.									
0	19 6 9.46	2.3215	S. 26 26 5.3	1.576					
1	19 8 28.78	2.3225	26 24 26.5	1.718					
2	19 10 48.16	2.3233	26 22 39.2	1.859					
3	19 13 7.58	2.3241	26 20 43.4	2.002					
4	19 15 27.05	2.3248	26 18 39.0	2.144					
5	19 17 46.55	2.3253	26 16 26.1	2.287					
6	19 20 6.09	2.3259	26 14 4.6	2.429					
7	19 22 25.66	2.3263	26 11 34.6	2.572					
8	19 24 45.25	2.3268	26 8 56.0	2.714					
9	19 27 4.87	2.3271	26 6 8.9	2.857					
10	19 29 24.50	2.3273	26 3 13.2	3.000					
11	19 31 44.15	2.3275	26 0 8.9	3.143					
12	19 34 3.80	2.3276	25 56 56.1	3.285					
13	19 36 23.46	2.3277	25 53 34.7	3.428					
14	19 38 43.12	2.3276	25 50 4.8	3.570					
15	19 41 2.77	2.3274	25 46 26.3	3.713					
16	19 43 22.41	2.3273	25 42 39.3	3.855					
17	19 45 42.04	2.3270	25 38 43.7	3.998					
18	19 48 1.65	2.3267	25 34 39.6	4.139					
19	19 50 21.24	2.3263	25 30 27.0	4.281					
20	19 52 40.81	2.3259	25 26 5.9	4.423					
21	19 55 0.35	2.3254	25 21 36.2	4.565					
22	19 57 19.86	2.3248	25 16 58.1	4.706					
23	19 59 39.33	2.3242	25 12 11.5	4.848					
24	20 1 58.76	2.3235	S. 25 7 16.4	4.989					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
1	JUPITER W.	73 59 32	2892	75 32 1	2882	77 4 42	2872	78 37 37	2860
	Spica W.	60 46 25	2957	62 17 32	2946	63 48 52	2935	65 20 27	2923
	SUN E.	107 27 31	3312	106 3 33	3300	104 39 21	3288	103 14 55	3276
2	JUPITER W.	86 26 1	2798	88 0 31	2785	89 35 18	2771	91 10 24	2757
	Spica W.	73 2 16	2858	74 35 28	2844	76 8 59	2829	77 42 49	2815
	Antares W.	27 10 39	2881	28 43 22	2864	30 16 27	2846	31 49 55	2829
	SUN E.	96 8 57	3207	94 42 56	3192	93 16 36	3176	91 49 58	3160
3	JUPITER W.	99 10 43	2681	100 47 48	2665	102 25 15	2649	104 3 4	2632
	Spica W.	85 36 47	2738	87 12 36	2721	88 48 47	2704	90 25 21	2688
	Antares W.	39 42 52	2742	41 18 36	2725	42 54 43	2707	44 31 14	2688
	SUN E.	84 31 58	3077	83 3 20	3059	81 34 20	3041	80 4 58	3022
4	JUPITER W.	112 17 58	2545	113 58 9	2527	115 38 44	2509	117 19 45	2491
	Spica W.	98 33 56	2600	100 12 51	2582	101 52 11	2564	103 31 55	2546
	Antares W.	52 39 57	2596	54 18 57	2578	55 58 22	2559	57 38 14	2540
	SUN E.	72 32 19	2927	71 0 35	2908	69 28 26	2888	67 55 52	2868
5	Antares W.	66 4 10	2444	67 46 42	2425	69 29 40	2406	71 13 6	2387
	SUN E.	60 6 34	2768	58 31 24	2748	56 55 48	2728	55 19 45	2708
6	Antares W.	79 57 2	2295	81 43 9	2277	83 29 43	2260	85 16 42	2242
	SUN E.	47 12 59	2612	45 34 20	2593	43 55 16	2575	42 15 47	2558
7	Antares W.	94 17 55	2161	96 7 22	2146	97 57 11	2132	99 47 22	2118
	SUN E.	33 52 37	2479	32 10 54	2465	30 28 51	2453	28 46 31	2442
11	SUN W.	22 52 10	2343	24 37 7	2346	26 21 59	2351	28 6 45	2357
	Pollux E.	68 45 18	2012	66 52 2	2021	64 59 0	2030	63 6 11	2039
	Regulus E.	105 2 24	2024	103 9 27	2031	101 16 41	2039	99 24 7	2048
12	SUN W.	36 47 52	2402	38 31 22	2415	40 14 35	2428	41 57 30	2442
	Pollux E.	53 46 4	2094	51 54 56	2107	50 4 8	2121	48 13 41	2135
	Regulus E.	90 5 10	2102	88 14 15	2115	86 23 39	2129	84 33 24	2143
13	SUN W.	50 27 2	2517	52 7 52	2533	53 48 19	2550	55 28 23	2567
	Pollux E.	39 6 58	2212	37 18 48	2229	35 31 4	2246	33 43 45	2263
	Regulus E.	75 27 30	2217	73 39 28	2233	71 51 50	2250	70 4 37	2266
	JUPITER E.	114 48 27	2170	112 59 14	2185	111 10 24	2201	109 21 58	2217
14	SUN W.	63 42 46	2656	65 20 25	2674	66 57 40	2692	68 34 31	2710
	Aldebaran W.	20 25 0	2544	22 5 12	2533	23 45 39	2527	25 26 14	2526
	Regulus E.	61 14 45	2353	59 30 3	2371	57 45 48	2390	56 1 59	2408
	JUPITER E.	100 25 55	2301	98 39 57	2318	96 54 24	2335	95 9 16	2352
	Spica E.	115 18 12	2355	113 33 33	2371	111 49 17	2388	110 5 25	2405
15	SUN W.	76 32 37	2803	78 7 1	2821	79 41 2	2839	81 14 39	2857
	Aldebaran W.	33 48 25	2556	35 28 20	2566	37 8 2	2577	38 47 28	2589
	MARS W.	21 23 16	2675	23 0 29	2692	24 37 19	2710	26 13 45	2728
	Regulus E.	47 29 22	2501	45 48 10	2520	44 7 24	2538	42 27 4	2557
	JUPITER E.	86 29 47	2438	84 47 7	2455	83 4 51	2472	81 22 59	2489

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	JUPITER	W.	80 10 47	2848	81 44 12	2837	83 17 52	2825	84 51 48	2812
	Spica	W.	66 52 17	2911	68 24 22	2898	69 56 43	2885	71 29 21	2872
	SUN	E.	101 50 15	3263	100 25 20	3249	99 0 9	3235	97 34 41	3221
2	JUPITER	W.	92 45 48	2742	94 21 32	2727	95 57 35	2712	97 33 59	2697
	Spica	W.	79 16 57	2800	80 51 25	2785	82 26 12	2770	84 1 19	2754
	Antares	W.	33 23 45	2812	34 57 58	2795	36 32 33	2777	38 7 31	2760
	SUN	E.	90 23 2	3144	88 55 46	3128	87 28 11	3111	86 0 15	3094
3	JUPITER	W.	105 41 16	2615	107 19 51	2598	108 58 49	2580	110 38 11	2562
	Spica	W.	92 2 17	2671	93 39 36	2653	95 17 19	2635	96 55 26	2618
	Antares	W.	46 8 10	2670	47 45 30	2652	49 23 14	2634	51 1 23	2615
	SUN	E.	78 35 13	3004	77 5 5	2985	75 34 34	2966	74 3 39	2946
4	JUPITER	W.	119 1 11	2472	120 43 3	2454	122 25 20	2436	124 8 4	2417
	Spica	W.	105 12 4	2528	106 52 39	2510	108 33 40	2491	110 15 6	2472
	Antares	W.	59 18 32	2521	60 59 16	2502	62 40 27	2482	64 22 5	2463
	SUN	E.	66 22 52	2848	64 49 26	2828	63 15 34	2808	61 41 17	2788
5	Antares	W.	72 56 59	2368	74 41 20	2350	76 26 7	2331	78 11 21	2313
	SUN	E.	53 43 16	2688	52 6 20	2669	50 28 59	2650	48 51 12	2631
6	Antares	W.	87 4 7	2225	88 51 57	2208	90 40 12	2192	92 28 52	2176
	SUN	E.	40 35 55	2541	38 55 39	2525	37 15 0	2509	35 33 59	2494
7	Antares	W.	101 37 53	2105	103 28 45	2092	105 19 56	2080	107 11 26	2068
	SUN	E.	27 3 56	2431	25 21 6	2422	23 38 3	2415	21 54 50	2410
11	SUN	W.	29 51 22	2364	31 35 49	2372	33 20 4	2381	35 4 6	2391
	Pollux	E.	61 13 37	2049	59 21 18	2059	57 29 16	2070	55 37 31	2082
	Regulus	E.	97 31 48	2058	95 39 44	2068	93 47 56	2079	91 56 24	2090
12	SUN	W.	43 40 5	2456	45 22 21	2470	47 4 16	2485	48 45 50	2501
	Pollux	E.	46 23 35	2150	44 33 51	2165	42 44 30	2180	40 55 32	2196
	Regulus	E.	82 43 29	2157	80 53 56	2171	79 4 45	2186	77 15 56	2201
13	SUN	W.	57 8 4	2585	58 47 20	2602	60 26 13	2619	62 4 42	2637
	Pollux	E.	31 56 51	2281	30 10 24	2300	28 24 24	2319	26 38 52	2339
	Regulus	E.	68 17 48	2283	66 31 24	2301	64 45 26	2318	62 59 53	2335
	JUPITER	E.	107 33 56	2234	105 46 19	2250	103 59 6	2267	102 12 18	2284
14	SUN	W.	70 10 57	2729	71 46 59	2747	73 22 36	2766	74 57 49	2785
	Aldebaran	W.	27 6 51	2527	28 47 26	2531	30 27 56	2538	32 8 17	2547
	Regulus	E.	54 18 35	2426	52 35 37	2445	50 53 6	2463	49 11 1	2482
	JUPITER	E.	93 24 32	2370	91 40 14	2387	89 56 20	2404	88 12 51	2422
	Spica	E.	108 21 58	2422	106 38 55	2439	104 56 16	2456	103 14 1	2472
15	SUN	W.	82 47 53	2875	84 20 43	2893	85 53 11	2910	87 25 17	2927
	Aldebaran	W.	40 26 38	2601	42 5 31	2614	43 44 7	2627	45 22 24	2640
	MARS	W.	27 49 47	2746	29 25 26	2763	31 0 42	2780	32 35 36	2797
	Regulus	E.	40 47 10	2576	39 7 42	2596	37 28 41	2615	35 50 7	2635
	JUPITER	E.	79 41 31	2506	78 0 26	2523	76 19 45	2539	74 39 26	2555

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
15	Spica E.	101 32 9	2490	99 50 42	2507	98 9 38	2524	96 28 58	2541
16	SUN W.	88 57 1	2945	90 28 23	2962	91 59 23	2979	93 30 2	2995
	Aldebaran W.	47 0 24	2654	48 38 5	2667	50 15 29	2681	51 52 35	2694
	MARS W.	34 10 7	2814	35 44 17	2831	37 18 5	2847	38 51 32	2863
	Regulus E.	34 11 59	2655	32 34 19	2675	30 57 6	2696	29 20 21	2718
	JUPITER E.	72 59 29	2571	71 19 55	2587	69 40 42	2603	68 1 51	2618
	Spica E.	88 11 23	2623	86 32 59	2639	84 54 56	2654	83 17 15	2669
17	SUN W.	100 58 18	3073	102 27 0	3088	103 55 23	3103	105 23 29	3117
	Aldebaran W.	59 53 37	2760	61 28 57	2772	63 4 1	2785	64 38 49	2798
	MARS W.	46 33 44	2939	48 5 13	2954	49 36 23	2968	51 7 16	2982
	Pollux W.	15 39 24	2776	17 14 23	2782	18 49 14	2789	20 23 56	2797
	JUPITER E.	59 52 41	2692	58 15 50	2705	56 39 17	2719	55 3 2	2732
	Spica E.	75 13 53	2743	73 38 11	2757	72 2 47	2771	70 27 42	2785
	Antares E.	121 7 26	2737	119 31 35	2750	117 56 2	2763	116 20 46	2776
18	SUN W.	112 39 47	3183	114 6 16	3196	115 32 30	3208	116 58 30	3220
	Aldebaran W.	72 28 50	2855	74 2 6	2866	75 35 8	2876	77 7 57	2887
	MARS W.	58 37 28	3046	60 6 44	3058	61 35 45	3069	63 4 32	3081
	Pollux W.	28 14 36	2844	29 48 7	2854	31 21 25	2863	32 54 31	2873
	JUPITER E.	47 6 6	2795	45 31 32	2807	43 57 13	2818	42 23 9	2829
	Spica E.	62 36 34	2848	61 3 9	2861	59 30 0	2873	57 57 6	2884
	Antares E.	108 28 31	2836	106 54 50	2848	105 21 24	2859	103 48 12	2869
19	SUN W.	124 5 11	3273	125 29 54	3282	126 54 26	3291	128 18 47	3300
	Aldebaran W.	84 48 47	2935	86 20 21	2943	87 51 45	2952	89 22 58	2961
	MARS W.	70 25 4	3133	71 52 34	3142	73 19 53	3151	74 47 1	3159
	Pollux W.	40 37 1	2917	42 8 58	2926	43 40 44	2934	45 12 20	2942
	JUPITER E.	34 36 19	2882	33 3 37	2892	31 31 8	2902	29 58 51	2912
	Spica E.	50 16 10	2938	48 44 39	2948	47 13 22	2958	45 42 17	2968
	Antares E.	96 5 25	2917	94 33 28	2926	93 1 42	2934	91 30 7	2942
20	Aldebaran W.	96 56 32	2998	98 26 47	3005	99 56 54	3011	101 26 53	3017
	MARS W.	82 0 13	3198	83 26 24	3205	84 52 27	3212	86 18 22	3218
	Pollux W.	52 47 57	2977	54 18 38	2983	55 49 12	2989	57 19 39	2995
	Regulus W.	17 3 16	3136	18 30 41	3149	19 58 27	3166	21 26 29	3196
	Spica E.	38 10 0	3018	36 40 9	3028	35 10 31	3038	33 41 5	3049
	Antares E.	83 54 40	2979	82 24 1	2986	80 53 31	2992	79 23 9	2998
21	Aldebaran W.	108 54 56	3046	110 24 12	3051	111 53 22	3056	113 22 25	3060
	MARS W.	93 26 13	3246	94 51 28	3251	96 16 37	3255	97 41 41	3259
	Pollux W.	64 50 8	3021	66 19 55	3025	67 49 37	3029	69 19 14	3033
	Regulus W.	28 48 41	3078	30 17 17	3077	31 45 55	3077	33 14 33	3076
	Antares E.	71 53 5	3026	70 23 24	3030	68 53 49	3034	67 24 19	3039
	α Aquilæ E.	116 2 50	4058	114 52 7	4037	113 41 4	4019	112 29 43	4001
22	MARS W.	104 45 51	3277	106 10 29	3280	107 35 3	3283	108 59 34	3285
	Pollux W.	76 46 10	3050	78 15 21	3052	79 44 29	3055	81 13 34	3057
	Regulus W.	40 37 38	3080	42 6 12	3081	43 34 45	3082	45 3 17	3082
	Antares E.	59 58 2	3057	58 29 0	3060	57 0 2	3063	55 31 8	3066
	α Aquilæ E.	106 29 5	3934	105 16 20	3925	104 3 26	3917	102 50 23	3909



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
15	Spica	E.	94 48 42	2558	93 8 49	2574	91 29 18	2590	89 50 9	2607
16	SUN	W.	95 0 21	3012	96 30 19	3027	97 59 58	3043	99 29 17	3058
	Aldebaran	W.	53 29 23	2707	55 5 53	2721	56 42 5	2734	58 18 0	2747
	MARS	W.	40 24 38	2879	41 57 24	2894	43 29 50	2909	45 1 57	2924
	Regulus	E.	27 44 6	2741	26 8 21	2765	24 33 7	2790	22 58 26	2818
	JUPITER	E.	66 23 20	2633	64 45 10	2648	63 7 21	2663	61 29 51	2678
	Spica	E.	81 39 54	2685	80 2 54	2700	78 26 14	2715	76 49 54	2729
17	SUN	W.	106 51 17	3131	108 18 49	3145	109 46 4	3158	111 13 3	3171
	Aldebaran	W.	66 13 20	2810	67 47 35	2822	69 21 35	2833	70 55 20	2844
	MARS	W.	52 37 51	2995	54 8 9	3009	55 38 11	3022	57 7 57	3034
	Pollux	W.	21 58 27	2806	23 32 47	2815	25 6 56	2825	26 40 52	2834
	JUPITER	E.	53 27 5	2745	51 51 26	2758	50 16 3	2770	48 40 56	2783
	Spica	E.	68 52 54	2798	67 18 24	2811	65 44 11	2824	64 10 14	2836
	Antares	E.	114 45 47	2789	113 11 5	2801	111 36 38	2813	110 2 27	2825
18	SUN	W.	118 24 16	3231	119 49 49	3242	121 15 9	3253	122 40 16	3263
	Aldebaran	W.	78 40 32	2897	80 12 54	2907	81 45 4	2917	83 17 1	2926
	MARS	W.	64 33 5	3092	66 1 24	3103	67 29 30	3114	68 57 23	3124
	Pollux	W.	34 27 24	2882	36 0 5	2891	37 32 35	2900	39 4 53	2909
	JUPITER	E.	40 49 19	2840	39 15 44	2851	37 42 22	2862	36 9 14	2872
	Spica	E.	56 24 27	2895	54 52 2	2906	53 19 51	2917	51 47 54	2927
	Antares	E.	102 15 13	2879	100 42 28	2889	99 9 55	2898	97 37 34	2908
19	SUN	W.	129 42 58	3309	131 6 58	3318	132 30 40	3326	133 54 30	3334
	Aldebaran	W.	90 54 0	2969	92 24 52	2976	93 55 35	2984	95 26 8	2991
	MARS	W.	76 13 59	3168	77 40 47	3176	79 7 2	3184	80 33 53	3191
	Pollux	W.	46 43 46	2950	48 15 2	2957	49 46 0	2964	51 17 7	2970
	JUPITER	E.	28 26 47	2921	26 54 55	2931	25 23 16	2941	23 51 50	2951
	Spica	E.	44 11 25	2978	42 40 45	2988	41 10 18	2998	39 40 3	3007
	Antares	E.	89 58 42	2950	88 27 28	2958	86 56 23	2965	85 25 27	2972
20	Aldebaran	W.	102 56 44	3023	104 26 28	3029	105 56 4	3034	107 25 34	3040
	MARS	W.	87 44 10	3224	89 9 50	3230	90 35 24	3235	92 0 52	3241
	Pollux	W.	58 49 58	3000	60 20 10	3005	61 50 16	3011	63 20 15	3016
	Regulus	W.	22 54 44	3089	24 23 7	3085	25 51 34	3082	27 20 6	3080
	Spica	E.	32 11 52	3060	30 42 53	3071	29 14 7	3083	27 45 36	3095
	Antares	E.	77 52 54	3004	76 22 47	3009	74 52 46	3015	73 22 52	3021
21	Aldebaran	W.	114 51 23	3065	116 20 15	3069	117 49 2	3074	119 17 43	3078
	MARS	W.	99 6 40	3263	100 31 34	3267	101 56 24	3271	103 21 9	3274
	Pollux	W.	70 48 46	3037	72 18 13	3040	73 47 36	3043	75 16 55	3047
	Regulus	W.	34 43 12	3077	36 11 50	3078	37 40 27	3078	39 9 3	3079
	Antares	E.	65 54 54	3043	64 25 34	3047	62 56 19	3050	61 27 8	3054
	α Aquilæ	E.	111 18 4	3985	110 6 10	3970	108 54 1	3957	107 41 39	3945
22	MARS	W.	110 24 3	3287	111 48 29	3289	113 12 52	3292	114 37 13	3295
	Pollux	W.	82 42 36	3059	84 11 35	3061	85 40 32	3063	87 9 26	3065
	Regulus	W.	46 31 48	3083	48 0 18	3084	49 28 47	3085	50 57 15	3085
	Antares	E.	54 2 18	3069	52 33 30	3071	51 4 46	3073	49 36 4	3076
	α Aquilæ	E.	101 37 11	3901	100 23 52	3896	99 10 28	3891	97 56 59	3887

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
23	Pollux W.	88 38 19	3066	90 7 10	3068	91 35 59	3069	93 4 47	3070
	Regulus W.	52 25 43	3086	53 54 10	3087	55 22 36	3087	56 51 2	3087
	JUPITER W.	14 12 41	3086	15 41 8	3078	17 9 44	3071	18 38 28	3066
	Antares E.	48 7 25	3078	46 38 49	3080	45 10 15	3082	43 41 44	3085
	α Aquilæ E.	96 43 25	3883	95 29 48	3880	94 16 8	3878	93 2 26	3877
24	Pollux W.	100 28 32	3073	101 57 15	3072	103 25 59	3072	104 54 43	3072
	Regulus W.	64 13 10	3087	65 41 36	3086	67 10 2	3085	68 38 30	3085
	JUPITER W.	26 3 28	3051	27 32 38	3049	29 1 50	3047	30 31 4	3045
	Antares E.	36 19 44	3093	34 51 26	3096	33 23 12	3098	31 55 0	3100
	α Aquilæ E.	86 53 51	3881	85 40 12	3885	84 26 37	3889	83 13 6	3894
	Fomalhaut E.	118 30 34	3287	117 6 7	3282	115 41 34	3276	114 16 54	3271
25	Regulus W.	76 1 3	3079	77 29 38	3078	78 58 15	3076	80 26 54	3074
	JUPITER W.	37 57 47	3037	39 27 14	3035	40 56 43	3033	42 26 15	3030
	Spica W.	22 15 15	3178	23 41 51	3165	25 8 42	3153	26 35 48	3142
	α Aquilæ E.	77 7 1	3930	75 54 12	3910	74 41 33	3951	73 29 5	3963
	Fomalhaut E.	107 12 11	3248	105 46 58	3244	104 21 41	3240	102 56 19	3236
	α Pegasi E.	124 38 31	3670	123 21 12	3650	122 3 31	3630	120 45 29	3610
26	Regulus W.	87 50 48	3062	89 19 44	3059	90 48 43	3056	92 17 46	3052
	JUPITER W.	49 54 38	3018	51 24 29	3015	52 54 23	3012	54 24 21	3009
	Spica W.	33 54 11	3101	35 22 20	3095	36 50 36	3088	38 19 0	3081
	α Aquilæ E.	67 30 12	4044	66 19 16	4064	65 8 39	4085	63 58 23	4109
	Fomalhaut E.	95 48 23	3218	94 22 35	3214	92 56 42	3210	91 30 45	3207
	α Pegasi E.	114 10 28	3531	112 50 38	3518	111 30 33	3505	110 10 14	3493
27	Regulus W.	99 44 9	3034	101 13 40	3030	102 43 16	3025	104 12 58	3019
	JUPITER W.	61 55 20	2983	63 25 48	2983	64 56 22	2978	66 27 2	2973
	Spica W.	45 42 57	3051	47 12 7	3045	48 41 24	3038	50 10 49	3032
	α Aquilæ E.	58 13 31	4264	57 6 4	4302	55 59 13	4344	54 53 1	4390
	Fomalhaut E.	84 19 57	3189	82 53 35	3186	81 27 9	3182	80 0 38	3178
	α Pegasi E.	103 25 30	3440	102 3 59	3431	100 42 17	3422	99 20 25	3413
28	Regulus W.	111 43 7	2991	113 13 30	2985	114 44 1	2979	116 14 40	2972
	JUPITER W.	74 2 1	2945	75 33 23	2938	77 4 54	2931	78 36 34	2924
	Spica W.	57 39 58	2998	59 10 13	2990	60 40 38	2982	62 11 13	2975
	Fomalhaut E.	72 47 2	3162	71 20 7	3158	69 53 7	3155	68 26 3	3152
	α Pegasi E.	92 28 43	3373	91 5 56	3367	89 43 2	3360	88 20 0	3354
29	JUPITER W.	86 17 14	2884	87 49 53	2875	89 22 44	2866	90 55 47	2856
	Spica W.	69 46 40	2931	71 18 19	2922	72 50 9	2912	74 22 12	2903
	Fomalhaut E.	61 9 52	3138	59 42 29	3136	58 15 3	3135	56 47 36	3134
	α Pegasi E.	81 23 1	3324	79 59 17	3319	78 35 27	3314	77 11 31	3310
	SUN E.	125 47 6	3272	124 22 22	3263	122 57 27	3253	121 32 20	3242
30	JUPITER W.	98 44 12	2804	100 18 34	2793	101 53 11	2781	103 28 3	2769
	Spica W.	82 5 43	2848	83 39 8	2837	85 12 48	2825	86 46 43	2813
	Antares W.	36 11 52	2855	37 45 9	2848	39 18 42	2828	40 52 33	2815
	Fomalhaut E.	49 30 15	3139	48 2 53	3143	46 35 35	3148	45 8 23	3155
	α Pegasi E.	70 10 46	3294	68 46 27	3292	67 22 6	3291	65 57 44	3291
	SUN E.	114 23 28	3184	112 56 59	3171	111 30 16	3158	110 3 17	3144

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
23	Pollux	W.	94 33 34	3071	96 2 19	3071	97 31 4	3072	98 59 48	3072
	Regulus	W.	58 19 28	3087	59 47 54	3087	61 16 19	3087	62 44 44	3087
	JUPITER	W.	20 7 19	3062	21 36 15	3059	23 5 16	3056	24 34 20	3053
	Antares	E.	42 13 16	3087	40 44 50	3088	39 16 26	3090	37 48 4	3091
	α Aquilæ	E.	91 48 42	3876	90 34 58	3877	89 21 15	3878	88 7 32	3879
24	Pollux	W.	106 23 27	3071	107 52 12	3071	109 20 57	3070	110 49 43	3069
	Regulus	W.	70 6 58	3084	71 35 27	3083	73 3 58	3082	74 32 30	3081
	JUPITER	W.	32 0 21	3044	33 29 39	3042	34 59 0	3041	36 28 22	3039
	Antares	E.	30 26 50	3103	28 58 44	3106	27 30 41	3109	26 2 42	3112
	α Aquilæ	E.	81 59 40	3900	80 46 20	3906	79 33 6	3913	78 19 59	3921
	Fomalhaut	E.	112 52 9	3266	111 27 18	3261	110 2 21	3257	108 37 19	3252
25	Regulus	W.	81 55 36	3072	83 24 20	3070	84 53 6	3068	86 21 55	3065
	JUPITER	W.	43 55 50	3028	45 25 28	3026	46 55 8	3024	48 24 51	3021
	Spica	W.	28 3 7	3132	29 30 38	3123	30 58 19	3115	32 26 10	3108
	α Aquilæ	E.	72 16 49	3977	71 4 47	3992	69 52 59	4008	68 41 27	4025
	Fomalhaut	E.	101 30 53	3232	100 5 22	3229	98 39 47	3225	97 14 7	3221
	α Pegasi	E.	119 27 6	3592	118 8 23	3575	116 49 22	3559	115 30 3	3545
26	Regulus	W.	93 46 54	3049	95 16 6	3046	96 45 22	3042	98 14 43	3038
	JUPITER	W.	55 54 24	3005	57 24 31	3001	58 54 42	2997	60 24 58	2993
	Spica	W.	39 47 33	3075	41 16 13	3069	42 45 0	3063	44 13 55	3057
	α Aquilæ	E.	62 48 31	4135	61 39 4	4163	60 30 3	4194	59 21 31	4228
	Fomalhaut	E.	90 4 44	3203	88 38 39	3196	87 12 29	3196	85 46 15	3193
	α Pegasi	E.	108 49 42	3482	107 28 57	3471	106 8 0	3460	104 46 51	3450
27	Regulus	W.	105 42 47	3014	107 12 42	3009	108 42 43	3003	110 12 51	2997
	JUPITER	W.	67 57 48	2968	69 28 41	2963	70 59 40	2957	72 30 47	2951
	Spica	W.	51 40 23	3026	53 10 4	3019	54 39 54	3012	56 9 52	3005
	α Aquilæ	E.	53 47 31	4440	52 42 46	4495	51 38 50	4554	50 35 46	4618
	Fomalhaut	E.	78 34 3	3175	77 7 24	3172	75 40 41	3168	74 13 54	3165
	α Pegasi	E.	97 58 23	3405	96 36 12	3396	95 13 51	3388	93 51 21	3381
28	Regulus	W.	117 45 28	2965	119 16 25	2958	120 47 30	2950	122 18 45	2943
	JUPITER	W.	80 8 22	2916	81 40 20	2909	83 12 28	2901	84 44 46	2893
	Spica	W.	63 41 57	2967	65 12 51	2958	66 43 56	2949	68 15 12	2940
	Fomalhaut	E.	66 58 56	3148	65 31 45	3145	64 4 30	3143	62 37 12	3141
	α Pegasi	E.	86 56 51	3347	85 33 34	3341	84 10 10	3335	82 46 39	3329
29	JUPITER	W.	92 29 2	2846	94 2 30	2836	95 36 10	2826	97 10 4	2815
	Spica	W.	75 54 27	2893	77 26 55	2882	78 59 37	2871	80 32 33	2860
	Fomalhaut	E.	55 20 7	3133	53 52 38	3133	52 25 9	3134	50 57 41	3136
	α Pegasi	E.	75 47 31	3306	74 23 26	3302	72 59 16	3299	71 35 2	3296
	SUN	E.	120 7 1	3231	118 41 28	3220	117 15 42	3208	115 49 42	3196
30	JUPITER	W.	105 3 11	2757	106 38 35	2745	108 14 15	2732	109 50 12	2719
	Spica	W.	88 20 54	2801	89 55 21	2788	91 30 5	2775	93 5 6	2761
	Antares	W.	42 26 41	2902	44 1 6	2788	45 35 50	2774	47 10 53	2760
	Fomalhaut	E.	43 41 20	3164	42 14 28	3175	40 47 49	3189	39 21 26	3207
	α Pegasi	E.	64 33 22	3292	63 9 0	3294	61 44 41	3297	60 20 25	3300
	SUN	E.	108 36 1	3131	107 8 29	3117	105 40 40	3102	104 12 33	3088

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.					
		Apparent Right Ascension.			Diff. for 1 Hour.	Apparent Declination.					Diff. for 1 Hour.	Semi-diameter.			
		h	m	s	s	°	'	"	"	'	"	s	m	s	s
SUN.	1	2	31	13.05	9.529	N. 14	53	28.3	+45.74	15	54.02	65.99	2	54.71	0.326
Mon.	2	2	35	2.02	9.552	15	11	39.0	45.13	15	53.77	66.06	3	2.28	0.303
Tues.	3	2	38	51.56	9.576	15	29	34.8	44.50	15	53.53	66.14	3	9.28	0.280
Wed.	4	2	42	41.66	9.600	15	47	15.5	+43.86	15	53.29	66.22	3	15.72	0.256
Thur.	5	2	46	32.33	9.624	16	4	40.7	43.20	15	53.06	66.30	3	21.59	0.232
Frid.	6	2	50	23.58	9.648	16	21	49.9	42.53	15	52.83	66.38	3	26.89	0.208
Sat.	7	2	54	15.40	9.672	16	38	42.8	+41.85	15	52.60	66.46	3	31.61	0.184
SUN.	8	2	58	7.80	9.696	16	55	19.3	41.16	15	52.38	66.54	3	35.75	0.160
Mon.	9	3	2	0.78	9.720	17	11	38.9	40.45	15	52.16	66.62	3	39.31	0.136
Tues.	10	3	5	54.34	9.743	17	27	41.3	+39.73	15	51.94	66.71	3	42.30	0.112
Wed.	11	3	9	48.46	9.767	17	43	26.1	38.99	15	51.73	66.79	3	44.73	0.088
Thur.	12	3	13	43.15	9.790	17	58	53.1	38.24	15	51.52	66.87	3	46.60	0.065
Frid.	13	3	17	38.40	9.814	18	14	2.0	+37.47	15	51.32	66.96	3	47.91	0.042
Sat.	14	3	21	34.20	9.837	18	28	52.3	36.69	15	51.11	67.04	3	48.65	0.019
SUN.	15	3	25	30.56	9.860	18	43	23.9	35.91	15	50.92	67.12	3	48.84	0.004
Mon.	16	3	29	27.47	9.883	18	57	36.6	+35.11	15	50.73	67.20	3	48.48	0.027
Tues.	17	3	33	24.94	9.906	19	11	30.0	34.30	15	50.54	67.28	3	47.58	0.050
Wed.	18	3	37	22.96	9.929	19	25	3.7	33.48	15	50.36	67.36	3	46.13	0.072
Thur.	19	3	41	21.52	9.952	19	38	17.6	+32.65	15	50.18	67.44	3	44.14	0.095
Frid.	20	3	45	20.62	9.974	19	51	11.5	31.81	15	50.00	67.52	3	41.60	0.117
Sat.	21	3	49	20.26	9.996	20	3	45.0	30.96	15	49.82	67.60	3	38.53	0.139
SUN.	22	3	53	20.43	10.018	20	15	58.0	+30.10	15	49.64	67.68	3	34.92	0.161
Mon.	23	3	57	21.13	10.040	20	27	50.2	29.22	15	49.46	67.75	3	30.78	0.183
Tues.	24	4	1	22.36	10.062	20	39	21.4	28.34	15	49.29	67.82	3	26.12	0.205
Wed.	25	4	5	24.11	10.083	20	50	31.5	+27.46	15	49.12	67.89	3	20.95	0.226
Thur.	26	4	9	26.36	10.104	21	1	20.1	26.56	15	48.95	67.96	3	15.28	0.247
Frid.	27	4	13	29.11	10.125	21	11	47.0	25.65	15	48.79	68.03	3	9.10	0.268
Sat.	28	4	17	32.35	10.145	21	21	52.0	+24.73	15	48.63	68.10	3	2.43	0.288
SUN.	29	4	21	36.07	10.165	21	31	35.0	23.81	15	48.48	68.16	2	55.28	0.308
Mon.	30	4	25	40.28	10.185	21	40	55.7	22.88	15	48.32	68.22	2	47.65	0.327
Tues.	31	4	29	44.96	10.204	21	49	53.9	21.94	15	48.17	68.28	2	39.56	0.346
Wed.	32	4	33	50.08	10.222	N. 21	58	29.4	+20.99	15	48.02	68.34	2	31.02	0.365

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18 from the sidereal time.  
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Equation of Time, to be Added to Mean Time.		Sidereal Time, or Right Ascension of Mean Sun.		
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.						
		h m s	s	° ' "	"	m s	s		h m s		
SUN.	1	2 31 13.51	9.530	N.14 53 30.4	+45.75	2 54.74	0.326		2 34 8.25		
Mon.	2	2 35 2.50	9.553	15 11 41.2	45.14	3 2.30	0.303		2 38 4.80		
Tues.	3	2 38 52.05	9.577	15 29 37.1	44.51	3 9.31	0.280		2 42 1.36		
Wed.	4	2 42 42.17	9.600	15 47 17.8	+43.87	3 15.75	0.256		2 45 57.92		
Thur.	5	2 46 32.86	9.624	16 4 43.0	43.21	3 21.61	0.232		2 49 54.47		
Frid.	6	2 50 24.12	9.648	16 21 52.2	42.54	3 26.90	0.208		2 53 51.03		
Sat.	7	2 54 15.96	9.672	16 38 45.2	+41.86	3 31.62	0.184		2 57 47.58		
SUN.	8	2 58 8.38	9.696	16 55 21.7	41.16	3 35.76	0.160		3 1 44.14		
Mon.	9	3 2 1.37	9.720	17 11 41.3	40.45	3 39.33	0.136		3 5 40.69		
Tues.	10	3 5 54.93	9.744	17 27 43.7	+39.73	3 42.32	0.112		3 9 37.25		
Wed.	11	3 9 49.06	9.767	17 43 28.5	38.99	3 44.75	0.088		3 13 33.81		
Thur.	12	3 13 43.75	9.791	17 58 55.5	38.24	3 46.61	0.065		3 17 30.36		
Frid.	13	3 17 39.01	9.814	18 14 4.3	+37.48	3 47.91	0.042		3 21 26.92		
Sat.	14	3 21 34.82	9.837	18 28 54.6	36.71	3 48.66	0.019		3 25 23.47		
SUN.	15	3 25 31.18	9.860	18 43 26.2	35.92	3 48.86	0.004		3 29 20.03		
Mon.	16	3 29 28.09	9.883	18 57 38.8	+35.11	3 48.50	0.027		3 33 16.59		
Tues.	17	3 33 25.56	9.906	19 11 32.1	34.30	3 47.59	0.050		3 37 13.14		
Wed.	18	3 37 23.57	9.929	19 25 5.7	33.48	3 46.13	0.072		3 41 9.70		
Thur.	19	3 41 22.13	9.951	19 38 19.6	+32.65	3 44.13	0.095		3 45 6.26		
Frid.	20	3 45 21.23	9.974	19 51 13.4	31.81	3 41.59	0.117		3 49 2.82		
Sat.	21	3 49 20.86	9.996	20 3 46.9	30.96	3 38.51	0.139		3 52 59.37		
SUN.	22	3 53 21.03	10.018	20 15 59.8	+30.10	3 34.90	0.161		3 56 55.93		
Mon.	23	3 57 21.72	10.040	20 27 51.9	29.23	3 30.77	0.183		4 0 52.49		
Tues.	24	4 1 22.93	10.062	20 39 23.0	28.35	3 26.11	0.205		4 4 49.04		
Wed.	25	4 5 24.66	10.083	20 50 33.0	+27.46	3 20.94	0.226		4 8 45.60		
Thur.	26	4 9 26.90	10.104	21 1 21.5	26.56	3 15.26	0.247		4 12 42.16		
Frid.	27	4 13 29.63	10.124	21 11 48.3	25.65	3 9.09	0.268		4 16 38.72		
Sat.	28	4 17 32.85	10.145	21 21 53.2	+24.73	3 2.42	0.288		4 20 35.27		
SUN.	29	4 21 36.56	10.165	21 31 36.1	23.81	2 55.27	0.308		4 24 31.83		
Mon.	30	4 25 40.75	10.184	21 40 56.7	22.88	2 47.64	0.327		4 28 28.39		
Tues.	31	4 29 45.40	10.203	21 49 54.8	21.94	2 39.55	0.346		4 32 24.95		
Wed.	32	4 33 50.49	10.221	N.21 58 30.3	+20.99	2 31.02	0.365		4 36 21.51		

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour,  
+ 9<sup>s</sup>.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
		$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$	$''$	$''$			$^h$ $^m$ $^s$
1	121	40 13 38.6	13 37.8	145.53	— 0.87	0.003 3913	+ 46.5	21 22 21.09
2	122	41 11 50.5	11 49.5	145.47	0.91	0.003 5022	46.1	21 18 25.18
3	123	42 10 0.9	9 59.9	145.41	0.92	0.003 6122	45.6	21 14 29.27
4	124	43 8 10.0	8 8.8	145.35	— 0.89	0.003 7209	+ 45.0	21 10 33.36
5	125	44 6 17.7	6 16.3	145.29	0.85	0.003 8283	44.4	21 6 37.45
6	126	45 4 23.9	4 22.4	145.23	0.77	0.003 9340	43.7	21 2 41.54
7	127	46 2 28.6	2 27.0	145.17	— 0.66	0.004 0380	+ 43.0	20 58 45.63
8	128	47 0 31.9	0 30.1	145.11	0.53	0.004 1402	42.2	20 54 49.72
9	129	47 58 33.6	58 31.7	145.04	0.38	0.004 2404	41.4	20 50 53.82
10	130	48 56 33.7	56 31.7	144.97	— 0.24	0.004 3387	+ 40.6	20 46 57.91
11	131	49 54 32.2	54 30.0	144.90	— 0.10	0.004 4351	39.8	20 43 2.00
12	132	50 52 28.9	52 26.5	144.83	+ 0.03	0.004 5296	39.0	20 39 6.08
13	133	51 50 23.8	50 21.3	144.75	+ 0.15	0.004 6223	+ 38.3	20 35 10.17
14	134	52 48 17.0	48 14.3	144.68	0.22	0.004 7133	37.6	20 31 14.26
15	135	53 46 8.4	46 5.6	144.61	0.28	0.004 8027	36.9	20 27 18.35
16	136	54 43 58.1	43 55.1	144.53	+ 0.31	0.004 8906	+ 36.3	20 23 22.44
17	137	55 41 46.1	41 42.9	144.46	0.31	0.004 9771	35.8	20 19 26.53
18	138	56 39 32.4	39 29.1	144.39	0.27	0.005 0623	35.3	20 15 30.62
19	139	57 37 17.1	37 13.6	144.33	+ 0.20	0.005 1463	+ 34.8	20 11 34.71
20	140	58 35 0.2	34 56.5	144.26	0.12	0.005 2291	34.3	20 7 38.80
21	141	59 32 41.8	32 38.0	144.20	+ 0.02	0.005 3108	33.8	20 3 42.89
22	142	60 30 21.9	30 18.0	144.14	— 0.09	0.005 3914	+ 33.4	19 59 46.98
23	143	61 28 0.7	27 56.6	144.09	0.22	0.005 4709	32.9	19 55 51.07
24	144	62 25 38.2	25 33.9	144.04	0.34	0.005 5493	32.4	19 51 55.15
25	145	63 23 14.5	23 10.0	143.99	— 0.46	0.005 6266	+ 31.9	19 47 59.24
26	146	64 20 49.6	20 44.9	143.94	0.57	0.005 7028	31.5	19 44 3.33
27	147	65 18 23.6	18 18.8	143.90	0.68	0.005 7779	31.0	19 40 7.42
28	148	66 15 56.6	15 51.7	143.86	— 0.75	0.005 8518	+ 30.5	19 36 11.51
29	149	67 13 28.8	13 23.6	143.82	0.79	0.005 9243	29.9	19 32 15.60
30	150	68 11 0.1	10 54.7	143.79	0.81	0.005 9954	29.3	19 28 19.68
31	151	69 8 30.6	8 25.0	143.75	0.81	0.006 0649	28.6	19 24 23.77
32	152	70 6 0.3	5 54.5	143.72	— 0.77	0.006 1328	+ 27.8	19 20 27.86

NOTE.—The numbers in column  $\lambda$  correspond to the true equinox of the date; in column  $\lambda'$  to the mean equinox of January 0.0.

Diff. for 1 Hour,  
— 9<sup>s</sup>.8296.  
(Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	' "	' "	' "	"	' "	"	h m	m	d
1	15 22.6	15 28.8	56 20.2	+ 1.83	56 43.0	+ 1.96	18 6.8	2.21	21.6
2	15 35.4	15 42.4	57 7.2	2.07	57 32.7	2.16	18 59.3	2.16	22.6
3	15 49.6	15 56.9	57 59.1	2.22	58 26.1	2.25	19 50.8	2.12	23.6
4	16 4.3	16 11.5	58 53.1	+ 2.24	59 19.7	+ 2.17	20 41.2	2.09	24.6
5	16 18.5	16 25.0	59 45.2	2.05	60 8.9	1.88	21 31.6	2.11	25.6
6	16 30.7	16 35.7	60 30.2	1.65	60 48.4	1.36	22 22.9	2.18	26.6
7	16 39.6	16 42.4	61 2.8	+ 1.03	61 13.0	+ 0.66	23 16.4	2.29	27.6
8	16 44.0	16 44.1	61 18.6	+ 0.26	61 19.2	- 0.16	6	.	28.6
9	16 42.9	16 40.4	61 14.8	- 0.57	61 5.5	0.96	0 12.9	2.43	0.3
10	16 36.6	16 31.7	60 51.7	- 1.32	60 33.8	- 1.64	1 12.8	2.56	1.3
11	16 25.9	16 19.3	60 12.3	1.90	59 48.0	2.11	2 15.1	2.62	2.3
12	16 12.1	16 4.5	59 21.6	2.26	58 53.7	2.35	3 17.7	2.58	3.3
13	15 56.6	15 48.8	58 25.0	- 2.39	57 56.3	- 2.38	4 18.3	2.45	4.3
14	15 41.1	15 33.7	57 28.0	2.32	57 0.7	2.23	5 14.7	2.25	5.3
15	15 26.6	15 19.9	56 34.6	2.10	56 10.2	1.95	6 6.4	2.05	6.3
16	15 13.8	15 8.2	55 47.7	- 1.79	55 27.3	- 1.61	6 53.6	1.89	7.3
17	15 3.2	14 58.9	55 9.0	1.43	54 53.0	1.24	7 37.2	1.76	8.3
18	14 55.1	14 51.9	54 39.2	1.06	54 27.6	0.88	8 18.4	1.68	9.3
19	14 49.3	14 47.3	54 18.1	- 0.70	54 10.7	- 0.53	8 58.3	1.65	10.3
20	14 45.8	14 44.9	54 5.3	0.37	54 1.8	- 0.22	9 38.0	1.66	11.3
21	14 44.5	14 44.4	54 0.1	- 0.07	54 0.0	+ 0.06	10 18.5	1.71	12.3
22	14 44.8	14 45.6	54 1.5	+ 0.18	54 4.4	+ 0.30	11 0.6	1.80	13.3
23	14 46.8	14 48.3	54 8.7	0.40	54 14.3	0.51	11 45.2	1.91	14.3
24	14 50.1	14 52.3	54 21.0	0.61	54 28.9	0.70	12 32.7	2.04	15.3
25	14 54.8	14 57.5	54 37.9	+ 0.80	54 48.0	+ 0.89	13 22.9	2.15	16.3
26	15 0.6	15 3.9	54 59.2	0.98	55 11.5	1.07	14 15.4	2.23	17.3
27	15 7.6	15 11.5	55 24.9	1.16	55 39.5	1.26	15 9.0	2.24	18.3
28	15 15.8	15 20.4	55 55.2	+ 1.35	56 12.0	+ 1.45	16 2.5	2.20	19.3
29	15 25.3	15 30.5	56 29.9	1.54	56 48.9	1.63	16 54.7	2.14	20.3
30	15 35.9	15 41.6	57 9.0	1.71	57 29.9	1.78	17 45.2	2.08	21.3
31	15 47.5	15 53.5	57 51.5	1.82	58 13.6	1.85	18 34.4	2.03	22.3
32	15 59.6	16 5.6	58 35.8	+ 1.85	58 57.9	+ 1.82	19 22.9	2.02	23.3

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 1.					TUESDAY 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 1 58.76	2.3235	S. 25 7 16.4	4.989	0	21 51 51.60	2.2448	S. 18 32 43.8	11.235
1	20 4 18.15	2.3228	25 2 12.8	5.130	1	21 54 6.22	2.2428	18 21 26.3	11.348
2	20 6 37.49	2.3219	24 57 0.8	5.270	2	21 56 20.73	2.2408	18 10 2.0	11.461
3	20 8 56.78	2.3210	24 51 40.4	5.411	3	21 58 35.12	2.2388	17 58 31.0	11.573
4	20 11 16.01	2.3201	24 46 11.5	5.552	4	22 0 49.39	2.2368	17 46 53.3	11.684
5	20 13 35.19	2.3192	24 40 34.2	5.691	5	22 3 3.54	2.2349	17 35 8.9	11.795
6	20 15 54.31	2.3181	24 34 48.6	5.830	6	22 5 17.58	2.2331	17 23 17.9	11.904
7	20 18 13.36	2.3170	24 28 54.6	5.969	7	22 7 31.51	2.2312	17 11 20.4	12.013
8	20 20 32.35	2.3159	24 22 52.3	6.108	8	22 9 45.33	2.2293	16 59 16.4	12.120
9	20 22 51.27	2.3148	24 16 41.6	6.248	9	22 11 59.03	2.2275	16 47 6.0	12.227
10	20 25 10.12	2.3135	24 10 22.6	6.386	10	22 14 12.63	2.2258	16 34 49.2	12.332
11	20 27 28.89	2.3122	24 3 55.3	6.523	11	22 16 26.12	2.2239	16 22 26.2	12.436
12	20 29 47.58	2.3108	23 57 19.8	6.661	12	22 18 39.50	2.2222	16 9 56.9	12.540
13	20 32 6.19	2.3095	23 50 36.0	6.798	13	22 20 52.78	2.2204	15 57 21.4	12.643
14	20 34 24.72	2.3080	23 43 44.1	6.934	14	22 23 5.95	2.2188	15 44 39.8	12.744
15	20 36 43.15	2.3065	23 36 43.9	7.071	15	22 25 19.03	2.2171	15 31 52.1	12.845
16	20 39 1.50	2.3051	23 29 35.6	7.206	16	22 27 32.00	2.2154	15 18 58.4	12.945
17	20 41 19.76	2.3035	23 22 19.2	7.341	17	22 29 44.88	2.2138	15 5 58.7	13.043
18	20 43 37.92	2.3019	23 14 54.7	7.476	18	22 31 57.66	2.2123	14 52 53.2	13.141
19	20 45 55.99	2.3003	23 7 22.1	7.610	19	22 34 10.35	2.2108	14 39 41.8	13.238
20	20 48 13.96	2.2987	22 59 41.5	7.744	20	22 36 22.95	2.2093	14 26 24.7	13.333
21	20 50 31.83	2.2970	22 51 52.8	7.878	21	22 38 35.46	2.2078	14 13 1.9	13.428
22	20 52 49.60	2.2953	22 43 56.2	8.010	22	22 40 47.89	2.2064	13 59 33.4	13.522
23	20 55 7.26	2.2935	S. 22 35 51.6	8.143	23	22 43 0.23	2.2050	S. 13 45 59.3	13.613
MONDAY 2.					WEDNESDAY 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 57 24.82	2.2918	S. 22 27 39.1	8.274	0	22 45 12.49	2.2037	S. 13 32 19.8	13.703
1	20 59 42.27	2.2899	22 19 18.7	8.405	1	22 47 24.67	2.2023	13 18 34.9	13.793
2	21 1 59.61	2.2881	22 10 50.5	8.535	2	22 49 36.77	2.2011	13 4 44.6	13.883
3	21 4 16.84	2.2863	22 2 14.5	8.665	3	22 51 48.80	2.1999	12 50 49.0	13.970
4	21 6 33.96	2.2844	21 53 30.7	8.794	4	22 54 0.76	2.1988	12 36 48.2	14.057
5	21 8 50.97	2.2825	21 44 39.2	8.923	5	22 56 12.65	2.1977	12 22 42.2	14.143
6	21 11 7.86	2.2806	21 35 40.0	9.051	6	22 58 24.48	2.1966	12 8 31.1	14.227
7	21 13 24.64	2.2787	21 26 33.1	9.178	7	23 0 36.24	2.1956	11 54 15.0	14.309
8	21 15 41.30	2.2767	21 17 18.6	9.305	8	23 2 47.95	2.1947	11 39 54.0	14.391
9	21 17 57.84	2.2747	21 7 56.5	9.432	9	23 4 59.60	2.1937	11 25 28.1	14.472
10	21 20 14.26	2.2728	20 58 26.8	9.558	10	23 7 11.19	2.1928	11 10 57.4	14.551
11	21 22 30.57	2.2708	20 48 49.6	9.682	11	23 9 22.73	2.1920	10 56 22.0	14.629
12	21 24 46.76	2.2689	20 39 5.0	9.805	12	23 11 34.23	2.1913	10 41 41.9	14.706
13	21 27 2.82	2.2668	20 29 13.0	9.928	13	23 13 45.69	2.1906	10 26 57.3	14.782
14	21 29 18.77	2.2648	20 19 13.6	10.051	14	23 15 57.10	2.1899	10 12 8.1	14.857
15	21 31 34.60	2.2628	20 9 6.9	10.173	15	23 18 8.48	2.1894	9 57 14.5	14.929
16	21 33 50.30	2.2608	19 58 52.9	10.294	16	23 20 19.83	2.1888	9 42 16.6	15.001
17	21 36 5.89	2.2588	19 48 31.6	10.415	17	23 22 31.14	2.1883	9 27 14.4	15.072
18	21 38 21.35	2.2567	19 38 3.1	10.534	18	23 24 42.43	2.1880	9 12 8.0	15.141
19	21 40 36.69	2.2547	19 27 27.5	10.653	19	23 26 53.70	2.1877	8 56 57.5	15.209
20	21 42 51.91	2.2527	19 16 44.8	10.771	20	23 29 4.95	2.1873	8 41 42.9	15.276
21	21 45 7.01	2.2507	19 5 55.0	10.888	21	23 31 16.18	2.1871	8 26 24.4	15.341
22	21 47 21.99	2.2487	18 54 58.2	11.004	22	23 33 27.40	2.1870	8 11 2.0	15.405
23	21 49 36.85	2.2468	18 43 54.5	11.120	23	23 35 38.62	2.1869	7 55 35.8	15.467
24	21 51 51.60	2.2448	S. 18 32 43.8	11.235	24	23 37 49.83	2.1868	S. 7 40 6.0	15.528



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 5.					SATURDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 37 49.83	2.1868	S. 7 40 6.0	15.528	0	1 24 6.23	2.2694	N. 5 26 11.0	16.578
1	23 40 1.04	2.1869	7 24 32.5	15.588	1	1 26 22.50	2.2729	5 42 45.0	16.555
2	23 42 12.26	2.1871	7 8 55.5	15.646	2	1 28 38.98	2.2765	5 59 17.6	16.531
3	23 44 23.49	2.1873	6 53 15.0	15.703	3	1 30 55.68	2.2802	6 15 48.7	16.504
4	23 46 34.73	2.1874	6 37 31.1	15.758	4	1 33 12.60	2.2839	6 32 18.1	16.475
5	23 48 45.98	2.1877	6 21 44.0	15.812	5	1 35 29.75	2.2877	6 48 45.7	16.445
6	23 50 57.25	2.1881	6 5 53.7	15.864	6	1 37 47.12	2.2915	7 5 11.5	16.413
7	23 53 8.55	2.1886	5 50 0.3	15.916	7	1 40 4.73	2.2954	7 21 35.3	16.378
8	23 55 19.88	2.1891	5 34 3.8	15.966	8	1 42 22.57	2.2993	7 37 56.9	16.341
9	23 57 31.24	2.1896	5 18 4.4	16.013	9	1 44 40.65	2.3034	7 54 16.2	16.303
10	23 59 42.63	2.1903	5 2 2.2	16.060	10	1 46 58.98	2.3076	8 10 33.2	16.262
11	0 1 54.07	2.1910	4 45 57.2	16.105	11	1 49 17.56	2.3117	8 26 47.6	16.218
12	0 4 5.55	2.1918	4 29 49.6	16.148	12	1 51 36.39	2.3159	8 42 59.4	16.173
13	0 6 17.08	2.1927	4 13 39.4	16.190	13	1 53 55.47	2.3203	8 59 8.4	16.126
14	0 8 28.67	2.1936	3 57 26.8	16.230	14	1 56 14.82	2.3247	9 15 14.5	16.077
15	0 10 40.31	2.1946	3 41 11.8	16.269	15	1 58 34.43	2.3290	9 31 17.6	16.026
16	0 12 52.02	2.1957	3 24 54.5	16.307	16	2 0 54.30	2.3334	9 47 17.6	15.973
17	0 15 3.79	2.1968	3 8 35.0	16.342	17	2 3 14.44	2.3380	10 3 14.3	15.917
18	0 17 15.63	2.1980	2 52 13.5	16.375	18	2 5 34.86	2.3426	10 19 7.6	15.859
19	0 19 27.55	2.1993	2 35 50.0	16.408	19	2 7 55.55	2.3474	10 34 57.4	15.799
20	0 21 39.55	2.2007	2 19 24.6	16.439	20	2 10 16.52	2.3518	10 50 43.5	15.737
21	0 23 51.63	2.2021	2 2 57.3	16.468	21	2 12 37.77	2.3566	11 6 25.8	15.673
22	0 26 3.80	2.2037	1 46 28.4	16.495	22	2 14 59.31	2.3613	11 22 4.2	15.607
23	0 28 16.07	2.2053	S. 1 29 57.9	16.521	23	2 17 21.13	2.3661	N. 11 37 38.6	15.538
FRIDAY 6.					SUNDAY 8.				
0	0 30 28.43	2.2069	S. 1 13 25.9	16.545	0	2 19 43.24	2.3709	N. 11 53 8.8	15.468
1	0 32 40.90	2.2087	0 56 52.5	16.567	1	2 22 5.64	2.3758	12 8 34.8	15.396
2	0 34 53.47	2.2104	0 40 17.9	16.587	2	2 24 28.34	2.3808	12 23 56.3	15.321
3	0 37 6.15	2.2123	0 23 42.1	16.606	3	2 26 51.34	2.3858	12 39 13.3	15.244
4	0 39 18.95	2.2143	S. 0 7 5.2	16.623	4	2 29 14.64	2.3908	12 54 25.6	15.165
5	0 41 31.87	2.2164	N. 0 9 32.7	16.638	5	2 31 38.24	2.3958	13 9 33.1	15.084
6	0 43 44.92	2.2185	0 26 11.4	16.652	6	2 34 2.14	2.4009	13 24 35.7	15.001
7	0 45 58.09	2.2207	0 42 50.9	16.664	7	2 36 26.35	2.4061	13 39 33.2	14.915
8	0 48 11.40	2.2230	0 59 31.1	16.674	8	2 38 50.87	2.4113	13 54 25.5	14.828
9	0 50 24.85	2.2253	1 16 11.8	16.682	9	2 41 15.70	2.4164	14 9 12.5	14.738
10	0 52 38.44	2.2278	1 32 52.9	16.688	10	2 43 40.84	2.4216	14 23 54.0	14.646
11	0 54 52.18	2.2303	1 49 34.4	16.693	11	2 46 6.29	2.4268	14 38 30.0	14.553
12	0 57 6.07	2.2328	2 6 16.0	16.694	12	2 48 32.05	2.4320	14 53 0.3	14.457
13	0 59 20.12	2.2355	2 22 57.7	16.696	13	2 50 58.13	2.4373	15 7 24.8	14.358
14	1 1 34.33	2.2382	2 39 39.5	16.695	14	2 53 24.52	2.4425	15 21 43.2	14.257
15	1 3 48.70	2.2409	2 56 21.1	16.692	15	2 55 51.23	2.4478	15 35 55.6	14.155
16	1 6 3.24	2.2438	3 13 2.5	16.687	16	2 58 18.26	2.4531	15 50 1.8	14.051
17	1 8 17.96	2.2468	3 29 43.5	16.679	17	3 0 45.60	2.4583	16 4 1.7	13.944
18	1 10 32.86	2.2498	3 46 24.0	16.671	18	3 3 13.26	2.4637	16 17 55.1	13.835
19	1 12 47.94	2.2528	4 3 4.0	16.661	19	3 5 41.24	2.4690	16 31 41.9	13.724
20	1 15 3.20	2.2560	4 19 43.3	16.648	20	3 8 9.54	2.4743	16 45 22.0	13.612
21	1 17 18.66	2.2593	4 36 21.7	16.633	21	3 10 38.16	2.4797	16 58 55.3	13.497
22	1 19 34.32	2.2626	4 52 59.2	16.617	22	3 13 7.10	2.4849	17 12 21.6	13.380
23	1 21 50.17	2.2659	5 9 35.7	16.598	23	3 15 36.35	2.4902	17 25 40.9	13.261
24	1 24 6.23	2.2694	N. 5 26 11.0	16.578	24	3 18 5.92	2.4955	N. 17 38 52.9	13.139

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 9.					WEDNESDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	3 18 5.92	2.4955	N.17 38 52.9	13.139	0	5 22 59.00	2.6735	N.25 17 23.2	5.435
1	3 20 35.81	2.5007	17 51 57.6	13.017	1	5 25 39.44	2.6743	25 22 43.7	5.248
2	3 23 6.01	2.5059	18 4 54.9	12.893	2	5 28 19.92	2.6750	25 27 53.0	5.061
3	3 25 36.52	2.5112	18 17 44.7	12.766	3	5 31 0.44	2.6757	25 32 51.0	4.873
4	3 28 7.35	2.5164	18 30 26.8	12.637	4	5 33 41.00	2.6762	25 37 37.7	4.685
5	3 30 38.49	2.5216	18 43 1.1	12.506	5	5 36 21.58	2.6764	25 42 13.2	4.497
6	3 33 9.94	2.5267	18 55 27.5	12.373	6	5 39 2.17	2.6766	25 46 37.3	4.308
7	3 35 41.69	2.5318	19 7 45.9	12.239	7	5 41 42.77	2.6766	25 50 50.1	4.119
8	3 38 13.75	2.5368	19 19 56.2	12.103	8	5 44 23.36	2.6763	25 54 51.6	3.930
9	3 40 46.11	2.5418	19 31 58.3	11.965	9	5 47 3.93	2.6760	25 58 41.7	3.741
10	3 43 18.77	2.5468	19 43 52.0	11.824	10	5 49 44.48	2.6755	26 2 20.5	3.553
11	3 45 51.73	2.5518	19 55 37.2	11.683	11	5 52 24.99	2.6748	26 5 48.0	3.363
12	3 48 24.99	2.5568	20 7 13.9	11.539	12	5 55 5.45	2.6739	26 9 4.1	3.174
13	3 50 58.54	2.5616	20 18 41.9	11.393	13	5 57 45.86	2.6729	26 12 8.9	2.985
14	3 53 32.38	2.5663	20 30 1.1	11.247	14	6 0 26.20	2.6718	26 15 2.3	2.796
15	3 56 6.50	2.5711	20 41 11.5	11.098	15	6 3 6.47	2.6704	26 17 44.4	2.607
16	3 58 40.91	2.5758	20 52 12.9	10.948	16	6 5 46.65	2.6688	26 20 15.1	2.418
17	4 1 15.59	2.5803	21 3 5.2	10.795	17	6 8 26.73	2.6672	26 22 34.6	2.231
18	4 3 50.55	2.5849	21 13 48.3	10.641	18	6 11 6.71	2.6654	26 24 42.8	2.043
19	4 6 25.78	2.5893	21 24 22.1	10.486	19	6 13 46.58	2.6634	26 26 39.7	1.854
20	4 9 1.27	2.5938	21 34 46.6	10.329	20	6 16 26.32	2.6613	26 28 25.3	1.667
21	4 11 37.03	2.5981	21 45 1.6	10.171	21	6 19 5.93	2.6590	26 29 59.7	1.481
22	4 14 13.04	2.6023	21 55 7.1	10.011	22	6 21 45.40	2.6565	26 31 23.0	1.294
23	4 16 49.30	2.6064	N.22 5 2.9	9.849	23	6 24 24.71	2.6538	N.26 32 35.0	1.108
TUESDAY 10.					THURSDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	4 19 25.81	2.6105	N.22 14 49.0	9.687	0	6 27 3.86	2.6511	N.26 33 35.9	0.923
1	4 22 2.56	2.6145	22 24 25.3	9.542	1	6 29 42.84	2.6481	26 34 25.7	0.738
2	4 24 39.55	2.6183	22 33 51.6	9.395	2	6 32 21.63	2.6449	26 35 4.4	0.553
3	4 27 16.76	2.6221	22 43 8.0	9.189	3	6 35 0.23	2.6417	26 35 32.1	0.370
4	4 29 54.20	2.6258	22 52 14.3	9.020	4	6 37 38.64	2.6384	26 35 48.8	0.187
5	4 32 31.85	2.6293	23 1 10.4	8.850	5	6 40 16.84	2.6348	26 35 54.5	+0.004
6	4 35 9.71	2.6328	23 9 56.3	8.679	6	6 42 54.82	2.6311	26 35 49.3	-0.177
7	4 37 47.78	2.6361	23 18 31.9	8.508	7	6 45 32.57	2.6273	26 35 33.3	0.357
8	4 40 26.04	2.6393	23 26 57.2	8.335	8	6 48 10.09	2.6233	26 35 6.5	0.537
9	4 43 4.50	2.6425	23 35 12.1	8.160	9	6 50 47.36	2.6191	26 34 28.9	0.717
10	4 45 43.14	2.6455	23 43 16.4	7.984	10	6 53 24.38	2.6148	26 33 40.5	0.895
11	4 48 21.96	2.6483	23 51 10.2	7.808	11	6 56 1.14	2.6105	26 32 41.5	1.072
12	4 51 0.94	2.6511	23 58 53.4	7.631	12	6 58 37.64	2.6060	26 31 31.9	1.248
13	4 53 40.09	2.6538	24 6 25.9	7.452	13	7 1 13.86	2.6013	26 30 11.7	1.423
14	4 56 19.39	2.6562	24 13 47.6	7.274	14	7 3 49.79	2.5964	26 28 41.1	1.598
15	4 58 58.83	2.6585	24 20 58.5	7.091	15	7 6 25.43	2.5915	26 27 0.0	1.771
16	5 1 38.41	2.6607	24 27 58.5	6.910	16	7 9 0.77	2.5864	26 25 8.6	1.943
17	5 4 18.12	2.6628	24 34 47.7	6.728	17	7 11 35.80	2.5812	26 23 6.8	2.115
18	5 6 57.95	2.6648	24 41 25.9	6.546	18	7 14 10.51	2.5758	26 20 54.8	2.284
19	5 9 37.89	2.6666	24 47 53.2	6.363	19	7 16 44.90	2.5705	26 18 32.7	2.453
20	5 12 17.94	2.6683	24 54 9.4	6.178	20	7 19 18.97	2.5650	26 16 0.5	2.621
21	5 14 58.08	2.6698	25 0 14.5	5.993	21	7 21 52.70	2.5593	26 13 18.2	2.788
22	5 17 38.31	2.6712	25 6 8.6	5.808	22	7 24 26.08	2.5535	26 10 26.0	2.953
23	5 20 18.62	2.6724	25 11 51.5	5.622	23	7 26 59.12	2.5477	26 7 23.9	3.118
24	5 22 59.00	2.6735	N.25 17 23.2	5.435	24	7 29 31.80	2.5417	N.26 4 11.9	3.281

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 13.					SUNDAY 15.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
0	7 29 31.80	2.5417	26 4 11.9	3.281	0	9 23 27.52	2.1953	20 45 58.6	9.415
1	7 32 4.12	2.5356	26 0 50.2	3.441	1	9 25 39.02	2.1881	20 36 30.9	9.507
2	7 34 36.07	2.5294	25 57 19.0	3.601	2	9 27 50.09	2.1808	20 26 57.8	9.598
3	7 37 7.65	2.5232	25 53 38.1	3.761	3	9 30 0.72	2.1736	20 17 19.2	9.687
4	7 39 38.85	2.5168	25 49 47.7	3.918	4	9 32 10.92	2.1664	20 7 35.4	9.774
5	7 42 9.67	2.5104	25 45 47.9	4.074	5	9 34 20.69	2.1593	19 57 46.3	9.861
6	7 44 40.10	2.5038	25 41 38.8	4.229	6	9 36 30.03	2.1522	19 47 52.1	9.946
7	7 47 10.13	2.4973	25 37 20.4	4.383	7	9 38 38.95	2.1451	19 37 52.8	10.030
8	7 49 39.77	2.4906	25 32 52.9	4.534	8	9 40 47.44	2.1380	19 27 48.5	10.113
9	7 52 9.00	2.4838	25 28 16.3	4.686	9	9 42 55.51	2.1310	19 17 39.3	10.194
10	7 54 37.83	2.4771	25 23 30.6	4.835	10	9 45 3.16	2.1241	19 7 25.2	10.274
11	7 57 6.25	2.4702	25 18 36.1	4.983	11	9 47 10.40	2.1173	18 57 6.4	10.353
12	7 59 34.25	2.4632	25 13 32.7	5.129	12	9 49 17.23	2.1104	18 46 42.9	10.430
13	8 2 1.83	2.4562	25 8 20.6	5.274	13	9 51 23.65	2.1037	18 36 14.8	10.506
14	8 4 28.99	2.4491	25 2 59.8	5.418	14	9 53 29.67	2.0969	18 25 42.2	10.581
15	8 6 55.72	2.4419	24 57 30.4	5.560	15	9 55 35.28	2.0902	18 15 5.1	10.654
16	8 9 22.02	2.4348	24 51 52.6	5.700	16	9 57 40.49	2.0836	18 4 23.7	10.726
17	8 11 47.89	2.4276	24 46 6.4	5.839	17	9 59 45.31	2.0770	17 53 38.0	10.797
18	8 14 13.33	2.4203	24 40 11.9	5.977	18	10 1 49.73	2.0705	17 42 48.1	10.867
19	8 16 38.33	2.4130	24 34 9.2	6.113	19	10 3 53.77	2.0641	17 31 54.0	10.936
20	8 19 2.89	2.4057	24 27 58.3	6.248	20	10 5 57.42	2.0577	17 20 55.8	11.003
21	8 21 27.01	2.3983	24 21 39.4	6.382	21	10 8 0.69	2.0513	17 9 53.6	11.070
22	8 23 50.68	2.3908	24 15 12.5	6.513	22	10 10 3.58	2.0450	16 58 47.4	11.135
23	8 26 13.91	2.3834	N. 24 8 37.8	6.643	23	10 12 6.09	2.0388	N. 16 47 37.4	11.199
SATURDAY 14.					MONDAY 16.				
0	h m s	s	N. ° ' "	"	0	h m s	s	N. ° ' "	"
0	8 28 36.69	2.3759	N. 24 1 55.3	6.773	0	10 14 8.23	2.0327	N. 16 36 23.5	11.262
1	8 30 59.02	2.3684	23 55 5.1	6.899	1	10 16 10.01	2.0266	16 25 5.9	11.333
2	8 33 20.90	2.3609	23 48 7.4	7.024	2	10 18 11.42	2.0205	16 13 44.7	11.383
3	8 35 42.33	2.3533	23 41 2.2	7.149	3	10 20 12.47	2.0146	16 2 19.9	11.443
4	8 38 3.30	2.3458	23 33 49.5	7.273	4	10 22 13.17	2.0088	15 50 51.5	11.502
5	8 40 23.82	2.3382	23 26 29.5	7.393	5	10 24 13.52	2.0029	15 39 19.7	11.558
6	8 42 43.88	2.3306	23 19 2.3	7.513	6	10 26 13.52	1.9972	15 27 44.5	11.614
7	8 45 3.49	2.3231	23 11 28.0	7.631	7	10 28 13.18	1.9914	15 16 6.0	11.669
8	8 47 22.65	2.3155	23 3 46.6	7.748	8	10 30 12.49	1.9858	15 4 24.2	11.723
9	8 49 41.35	2.3079	22 55 58.2	7.863	9	10 32 11.47	1.9803	14 52 39.2	11.777
10	8 51 59.60	2.3003	22 48 3.0	7.977	10	10 34 10.12	1.9748	14 40 51.0	11.828
11	8 54 17.39	2.2927	22 40 1.0	8.089	11	10 36 8.44	1.9693	14 28 59.8	11.878
12	8 56 34.72	2.2851	22 31 52.3	8.199	12	10 38 6.44	1.9640	14 17 5.6	11.928
13	8 58 51.60	2.2775	22 23 37.1	8.308	13	10 40 4.12	1.9587	14 5 8.4	11.977
14	9 1 8.02	2.2699	22 15 15.3	8.417	14	10 42 1.48	1.9535	13 53 8.4	12.024
15	9 3 23.99	2.2624	22 6 47.1	8.523	15	10 43 58.54	1.9484	13 41 5.5	12.071
16	9 5 39.51	2.2549	21 58 12.5	8.628	16	10 45 55.29	1.9433	13 28 59.9	12.116
17	9 7 54.58	2.2474	21 49 31.7	8.731	17	10 47 51.73	1.9383	13 16 51.6	12.161
18	9 10 9.20	2.2399	21 40 44.8	8.833	18	10 49 47.88	1.9333	13 4 40.6	12.205
19	9 12 23.37	2.2324	21 31 51.8	8.933	19	10 51 43.73	1.9284	12 52 27.0	12.248
20	9 14 37.09	2.2249	21 22 52.8	9.033	20	10 53 39.29	1.9237	12 40 10.9	12.289
21	9 16 50.36	2.2175	21 13 47.9	9.130	21	10 55 34.57	1.9190	12 27 52.3	12.330
22	9 19 3.19	2.2102	21 4 37.2	9.227	22	10 57 29.57	1.9143	12 15 31.3	12.369
23	9 21 15.58	2.2028	20 55 20.7	9.322	23	10 59 24.29	1.9098	12 3 8.0	12.408
24	9 23 27.52	2.1953	N. 20 45 58.6	9.415	24	11 1 18.74	1.9053	N. 11 50 42.3	12.447

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 17.					THURSDAY 19.				
0	11 1 18.74	1.9053	N. 11 50 42.3	12.447	0	12 28 59.43	1.7761	N. 1 25 21.0	13.315
1	11 3 12.92	1.9008	11 38 14.4	12.483	1	12 30 45.97	1.7752	1 12 2.1	13.315
2	11 5 6.84	1.8965	11 25 44.3	12.519	2	12 32 32.45	1.7743	0 58 43.2	13.315
3	11 7 0.50	1.8923	11 13 12.1	12.555	3	12 34 18.89	1.7736	0 45 24.3	13.314
4	11 8 53.91	1.8881	11 0 37.7	12.590	4	12 36 5.28	1.7728	0 32 5.5	13.312
5	11 10 47.07	1.8839	10 48 1.3	12.623	5	12 37 51.63	1.7722	0 18 46.8	13.309
6	11 12 39.98	1.8798	10 35 22.9	12.656	6	12 39 37.94	1.7716	N. 0 5 28.3	13.307
7	11 14 32.65	1.8758	10 22 42.6	12.688	7	12 41 24.22	1.7711	S. 0 7 50.0	13.303
8	11 16 25.08	1.8719	10 10 0.4	12.718	8	12 43 10.47	1.7707	0 21 8.0	13.298
9	11 18 17.28	1.8682	9 57 16.4	12.748	9	12 44 56.70	1.7703	0 34 25.8	13.293
10	11 20 9.26	1.8644	9 44 30.6	12.778	10	12 46 42.91	1.7700	0 47 43.2	13.287
11	11 22 1.01	1.8608	9 31 43.1	12.806	11	12 48 29.10	1.7698	1 1 0.2	13.280
12	11 23 52.55	1.8572	9 18 53.9	12.833	12	12 50 15.28	1.7696	1 14 16.8	13.273
13	11 25 43.87	1.8536	9 6 3.1	12.860	13	12 52 1.45	1.7695	1 27 32.9	13.265
14	11 27 34.98	1.8502	8 53 10.7	12.886	14	12 53 47.62	1.7695	1 40 48.6	13.257
15	11 29 25.89	1.8468	8 40 16.8	12.911	15	12 55 33.79	1.7695	1 54 3.7	13.247
16	11 31 16.59	1.8434	8 27 21.4	12.936	16	12 57 19.96	1.7696	2 7 18.2	13.237
17	11 33 7.10	1.8402	8 14 24.5	12.959	17	12 59 6.14	1.7698	2 20 32.1	13.227
18	11 34 57.41	1.8370	8 1 26.3	12.981	18	13 0 52.34	1.7701	2 33 45.4	13.216
19	11 36 47.54	1.8339	7 48 26.8	13.003	19	13 2 38.55	1.7703	2 46 58.0	13.203
20	11 38 37.48	1.8309	7 35 25.9	13.025	20	13 4 24.78	1.7708	3 0 9.8	13.190
21	11 40 27.25	1.8280	7 22 23.8	13.045	21	13 6 11.04	1.7712	3 13 20.8	13.177
22	11 42 16.84	1.8251	7 9 20.5	13.065	22	13 7 57.32	1.7717	3 26 31.0	13.163
23	11 44 6.26	1.8223	N. 6 56 16.0	13.083	23	13 9 43.64	1.7722	S. 3 39 40.4	13.148
WEDNESDAY 18.					FRIDAY 20.				
0	11 45 55.52	1.8196	N. 6 43 10.5	13.101	0	13 11 29.99	1.7728	S. 3 52 48.8	13.133
1	11 47 44.61	1.8169	6 30 3.9	13.118	1	13 13 16.38	1.7736	4 5 56.3	13.117
2	11 49 33.55	1.8144	6 16 56.3	13.135	2	13 15 2.82	1.7743	4 19 2.8	13.100
3	11 51 22.34	1.8119	6 3 47.7	13.151	3	13 16 49.30	1.7752	4 32 8.3	13.083
4	11 53 10.98	1.8095	5 50 38.2	13.166	4	13 18 35.84	1.7761	4 45 12.7	13.064
5	11 54 59.48	1.8072	5 37 27.8	13.180	5	13 20 22.43	1.7770	4 58 16.0	13.046
6	11 56 47.84	1.8048	5 24 16.6	13.193	6	13 22 9.08	1.7781	5 11 18.2	13.027
7	11 58 36.06	1.8026	5 11 4.6	13.206	7	13 23 55.80	1.7792	5 24 19.2	13.006
8	12 0 24.15	1.8005	4 57 51.9	13.218	8	13 25 42.58	1.7803	5 37 18.9	12.985
9	12 2 12.12	1.7984	4 44 38.4	13.230	9	13 27 29.43	1.7815	5 50 17.4	12.963
10	12 3 59.96	1.7964	4 31 24.3	13.241	10	13 29 16.36	1.7828	6 3 14.5	12.941
11	12 5 47.69	1.7945	4 18 9.5	13.251	11	13 31 3.36	1.7841	6 16 10.3	12.918
12	12 7 35.30	1.7927	4 4 54.2	13.259	12	13 32 50.45	1.7855	6 29 4.6	12.893
13	12 9 22.81	1.7909	3 51 38.4	13.268	13	13 34 37.62	1.7869	6 41 57.5	12.869
14	12 11 10.21	1.7892	3 38 22.1	13.276	14	13 36 24.88	1.7885	6 54 48.9	12.844
15	12 12 57.51	1.7875	3 25 5.3	13.283	15	13 38 12.24	1.7901	7 7 38.8	12.819
16	12 14 44.71	1.7860	3 11 48.1	13.290	16	13 39 59.69	1.7917	7 20 27.2	12.793
17	12 16 31.83	1.7846	2 58 30.5	13.296	17	13 41 47.24	1.7934	7 33 13.9	12.765
18	12 18 18.86	1.7831	2 45 12.6	13.300	18	13 43 34.90	1.7952	7 45 59.0	12.737
19	12 20 5.80	1.7818	2 31 54.5	13.304	19	13 45 22.66	1.7970	7 58 42.3	12.708
20	12 21 52.67	1.7805	2 18 36.1	13.308	20	13 47 10.54	1.7989	8 11 23.9	12.678
21	12 23 39.46	1.7793	2 5 17.5	13.311	21	13 48 58.53	1.8008	8 24 3.7	12.648
22	12 25 26.18	1.7782	1 51 58.8	13.313	22	13 50 46.64	1.8028	8 36 41.7	12.616
23	12 27 12.84	1.7771	1 38 39.9	13.315	23	13 52 34.87	1.8048	8 49 17.8	12.586
24	12 28 59.43	1.7761	N. 1 25 21.0	13.315	24	13 54 23.22	1.8069	S. 9 1 52.0	12.553

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 21.					MONDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	13 54 23.22	1.8069	S. 9 1 52.0	12.553	0	15 24 34.26	1.9683	S. 18 12 13.2	10.059
1	13 56 11.70	1.8092	9 14 24.2	12.520	1	15 26 32.49	1.9727	18 22 14.6	9.987
2	13 58 0.32	1.8114	9 26 54.4	12.487	2	15 28 30.98	1.9770	18 32 11.6	9.913
3	13 59 49.07	1.8137	9 39 22.6	12.452	3	15 30 29.73	1.9814	18 42 4.2	9.839
4	14 1 37.96	1.8161	9 51 48.6	12.416	4	15 32 28.75	1.9859	18 51 52.3	9.763
5	14 3 27.00	1.8185	10 4 12.5	12.380	5	15 34 28.04	1.9903	19 1 35.8	9.686
6	14 5 16.18	1.8209	10 16 34.2	12.343	6	15 36 27.59	1.9948	19 11 14.6	9.608
7	14 7 5.51	1.8235	10 28 53.7	12.306	7	15 38 27.41	1.9993	19 20 48.8	9.530
8	14 8 55.00	1.8261	10 41 10.9	12.267	8	15 40 27.50	2.0038	19 30 18.2	9.451
9	14 10 44.64	1.8287	10 53 25.7	12.228	9	15 42 27.86	2.0083	19 39 42.9	9.371
10	14 12 34.44	1.8313	11 5 38.2	12.188	10	15 44 28.50	2.0129	19 49 2.7	9.289
11	14 14 24.40	1.8341	11 17 48.3	12.148	11	15 46 29.41	2.0174	19 58 17.6	9.207
12	14 16 14.53	1.8369	11 29 55.9	12.106	12	15 48 30.59	2.0220	20 7 27.5	9.123
13	14 18 4.83	1.8398	11 42 1.0	12.063	13	15 50 32.05	2.0266	20 16 32.4	9.040
14	14 19 55.30	1.8426	11 54 3.5	12.020	14	15 52 33.78	2.0312	20 25 32.3	8.955
15	14 21 45.94	1.8455	12 6 3.4	11.977	15	15 54 35.79	2.0358	20 34 27.0	8.869
16	14 23 36.76	1.8486	12 18 0.7	11.933	16	15 56 38.08	2.0404	20 43 16.6	8.782
17	14 25 27.77	1.8517	12 29 55.3	11.887	17	15 58 40.64	2.0451	20 52 0.9	8.694
18	14 27 18.96	1.8548	12 41 47.1	11.841	18	16 0 43.49	2.0498	21 0 39.9	8.606
19	14 29 10.34	1.8579	12 53 36.1	11.793	19	16 2 46.61	2.0543	21 9 13.6	8.517
20	14 31 1.91	1.8611	13 5 22.2	11.745	20	16 4 50.01	2.0590	21 17 41.9	8.427
21	14 32 53.67	1.8643	13 17 5.5	11.697	21	16 6 53.69	2.0637	21 26 4.8	8.333
22	14 34 45.63	1.8677	13 28 45.8	11.647	22	16 8 57.65	2.0683	21 34 22.1	8.242
23	14 36 37.79	1.8710	S. 13 40 23.1	11.596	23	16 11 1.89	2.0730	S. 21 42 33.8	8.148
SUNDAY 22.					TUESDAY 24.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	14 38 30.15	1.8744	S. 13 51 57.3	11.545	0	16 13 6.41	2.0777	S. 21 50 39.9	8.055
1	14 40 22.72	1.8778	14 3 28.5	11.493	1	16 15 11.21	2.0823	21 58 40.4	7.960
2	14 42 15.49	1.8813	14 14 56.5	11.440	2	16 17 16.29	2.0870	22 6 35.1	7.863
3	14 44 8.48	1.8849	14 26 21.3	11.387	3	16 19 21.65	2.0917	22 14 24.0	7.767
4	14 46 1.68	1.8884	14 37 42.9	11.333	4	16 21 27.29	2.0963	22 22 7.1	7.669
5	14 47 55.09	1.8920	14 49 1.2	11.277	5	16 23 33.21	2.1010	22 29 44.3	7.570
6	14 49 48.72	1.8958	15 0 16.1	11.220	6	16 25 39.41	2.1056	22 37 15.5	7.470
7	14 51 42.58	1.8995	15 11 27.6	11.163	7	16 27 45.88	2.1102	22 44 40.7	7.370
8	14 53 36.66	1.9033	15 22 35.7	11.106	8	16 29 52.63	2.1148	22 51 59.9	7.268
9	14 55 30.97	1.9070	15 33 40.3	11.047	9	16 31 59.66	2.1194	22 59 12.9	7.165
10	14 57 25.50	1.9108	15 44 41.3	10.987	10	16 34 6.96	2.1239	23 6 19.7	7.062
11	14 59 20.26	1.9147	15 55 38.7	10.927	11	16 36 14.53	2.1285	23 13 20.3	6.958
12	15 1 15.26	1.9187	16 6 32.5	10.865	12	16 38 22.38	2.1331	23 20 14.7	6.853
13	15 3 10.50	1.9226	16 17 22.5	10.803	13	16 40 30.50	2.1377	23 27 2.7	6.747
14	15 5 5.97	1.9265	16 28 8.8	10.740	14	16 42 38.90	2.1422	23 33 44.3	6.640
15	15 7 1.68	1.9306	16 38 51.3	10.676	15	16 44 47.56	2.1466	23 40 19.5	6.533
16	15 8 57.64	1.9347	16 49 29.9	10.611	16	16 46 56.49	2.1511	23 46 48.2	6.423
17	15 10 53.84	1.9388	17 0 4.6	10.545	17	16 49 5.69	2.1555	23 53 10.3	6.313
18	15 12 50.29	1.9429	17 10 35.3	10.478	18	16 51 15.15	2.1599	23 59 25.8	6.203
19	15 14 46.99	1.9470	17 21 2.0	10.411	19	16 53 24.88	2.1643	24 5 34.7	6.093
20	15 16 43.93	1.9512	17 31 24.6	10.343	20	16 55 34.87	2.1687	24 11 36.9	5.983
21	15 18 41.13	1.9554	17 41 43.1	10.273	21	16 57 45.12	2.1729	24 17 32.3	5.873
22	15 20 38.58	1.9597	17 51 57.4	10.203	22	16 59 55.62	2.1772	24 23 21.0	5.754
23	15 22 36.29	1.9640	18 2 7.5	10.132	23	17 2 6.38	2.1815	24 29 2.8	5.639
24	15 24 34.26	1.9683	S. 18 12 13.2	10.059	24	17 4 17.40	2.1858	S. 24 34 37.7	5.524

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 25.					FRIDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	17 4 17.40	2.1858	S. 24 34 37.7	5.524	0	18 53 0.60	2.3177	S. 26 33 36.1	0.773
1	17 6 28.67	2.1899	24 40 5.7	5.408	1	18 55 19.69	2.3186	26 32 45.5	0.914
2	17 8 40.19	2.1940	24 45 26.6	5.290	2	18 57 38.83	2.3193	26 31 46.4	1.055
3	17 10 51.95	2.1981	24 50 40.5	5.173	3	18 59 58.01	2.3200	26 30 38.9	1.196
4	17 13 3.96	2.2021	24 55 47.3	5.054	4	19 2 17.23	2.3207	26 29 22.9	1.337
5	17 15 16.20	2.2061	25 0 47.0	4.935	5	19 4 36.49	2.3213	26 27 58.4	1.479
6	17 17 28.69	2.2101	25 5 39.5	4.814	6	19 6 55.78	2.3217	26 26 25.4	1.621
7	17 19 41.41	2.2140	25 10 24.7	4.693	7	19 9 15.09	2.3220	26 24 43.9	1.763
8	17 21 54.37	2.2178	25 15 2.7	4.572	8	19 11 34.42	2.3223	26 22 53.8	1.905
9	17 24 7.55	2.2216	25 19 33.3	4.449	9	19 13 53.77	2.3226	26 20 55.3	2.046
10	17 26 20.96	2.2253	25 23 56.6	4.326	10	19 16 13.13	2.3227	26 18 48.3	2.188
11	17 28 34.59	2.2291	25 28 12.4	4.202	11	19 18 32.49	2.3227	26 16 32.8	2.330
12	17 30 48.45	2.2328	25 32 20.8	4.078	12	19 20 51.85	2.3227	26 14 8.7	2.472
13	17 33 2.52	2.2363	25 36 21.7	3.952	13	19 23 11.21	2.3226	26 11 36.2	2.613
14	17 35 16.81	2.2399	25 40 15.0	3.826	14	19 25 30.56	2.3223	26 8 55.1	2.755
15	17 37 31.31	2.2433	25 44 0.8	3.700	15	19 27 49.89	2.3220	26 6 5.6	2.896
16	17 39 46.01	2.2468	25 47 39.0	3.573	16	19 30 9.20	2.3217	26 3 7.6	3.038
17	17 42 0.92	2.2502	25 51 9.5	3.444	17	19 32 28.49	2.3213	26 0 1.1	3.179
18	17 44 16.03	2.2534	25 54 32.3	3.315	18	19 34 47.75	2.3208	25 56 46.1	3.320
19	17 46 31.33	2.2566	25 57 47.3	3.186	19	19 37 6.98	2.3202	25 53 22.7	3.461
20	17 48 46.82	2.2598	26 0 54.6	3.057	20	19 39 26.17	2.3194	25 49 50.8	3.602
21	17 51 2.50	2.2628	26 3 54.1	2.926	21	19 41 45.31	2.3187	25 46 10.5	3.743
22	17 53 18.36	2.2659	26 6 45.7	2.794	22	19 44 4.41	2.3179	25 42 21.7	3.883
23	17 55 34.41	2.2689	S. 26 9 29.4	2.663	23	19 46 23.46	2.3170	S. 25 38 24.5	4.023
THURSDAY 26.					SATURDAY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	17 57 50.63	2.2718	S. 26 12 5.2	2.530	0	19 48 42.45	2.3160	S. 25 34 18.9	4.163
1	18 0 7.02	2.2745	26 14 33.0	2.398	1	19 51 1.38	2.3150	25 30 4.9	4.303
2	18 2 23.57	2.2773	26 16 52.9	2.265	2	19 53 20.25	2.3139	25 25 42.6	4.442
3	18 4 40.29	2.2800	26 19 4.8	2.131	3	19 55 39.05	2.3128	25 21 11.9	4.581
4	18 6 57.17	2.2826	26 21 8.6	1.996	4	19 57 57.78	2.3115	25 16 32.9	4.720
5	18 9 14.20	2.2851	26 23 4.3	1.861	5	20 0 16.43	2.3102	25 11 45.5	4.858
6	18 11 31.38	2.2875	26 24 51.9	1.726	6	20 2 35.00	2.3088	25 6 49.9	4.996
7	18 13 48.70	2.2898	26 26 31.4	1.591	7	20 4 53.48	2.3073	25 1 46.0	5.134
8	18 16 6.16	2.2922	26 28 2.8	1.454	8	20 7 11.88	2.3059	24 56 33.8	5.272
9	18 18 23.76	2.2944	26 29 25.9	1.317	9	20 9 30.19	2.3043	24 51 13.4	5.408
10	18 20 41.49	2.2965	26 30 40.8	1.180	10	20 11 48.40	2.3027	24 45 44.8	5.545
11	18 22 59.34	2.2986	26 31 47.5	1.043	11	20 14 6.51	2.3010	24 40 8.0	5.681
12	18 25 17.32	2.3006	26 32 46.0	0.905	12	20 16 24.52	2.2993	24 34 23.1	5.817
13	18 27 35.41	2.3024	26 33 36.1	0.767	13	20 18 42.43	2.2975	24 28 30.0	5.953
14	18 29 53.61	2.3042	26 34 18.0	0.629	14	20 21 0.22	2.2957	24 22 28.8	6.087
15	18 32 11.91	2.3059	26 34 51.6	0.490	15	20 23 17.91	2.2938	24 16 19.6	6.221
16	18 34 30.32	2.3076	26 35 16.8	0.350	16	20 25 35.48	2.2918	24 10 2.3	6.355
17	18 36 48.82	2.3091	26 35 33.6	0.211	17	20 27 52.93	2.2898	24 3 37.0	6.488
18	18 39 7.41	2.3106	26 35 42.1	-0.072	18	20 30 10.26	2.2878	23 57 3.7	6.621
19	18 41 26.09	2.3120	26 35 42.2	+0.069	19	20 32 27.47	2.2858	23 50 22.5	6.753
20	18 43 44.85	2.3133	26 35 33.8	0.210	20	20 34 44.55	2.2837	23 43 33.4	6.884
21	18 46 3.69	2.3146	26 35 17.0	0.350	21	20 37 1.51	2.2815	23 36 36.4	7.016
22	18 48 22.60	2.3157	26 34 51.8	0.490	22	20 39 18.33	2.2793	23 29 31.5	7.147
23	18 50 41.57	2.3167	26 34 18.2	0.631	23	20 41 35.02	2.2770	23 22 18.8	7.277
24	18 53 0.60	2.3177	S. 26 33 36.1	0.773	24	20 43 51.57	2.2748	S. 23 14 58.3	7.407

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 29.					TUESDAY 31.				
	<div>h m s</div>	<div>s</div>	<div>° ' "</div>	<div>"</div>		<div>h m s</div>	<div>s</div>	<div>° ' "</div>	<div>"</div>
0	20 43 51.57	2.2748	S. 23 14 58.3	7.407	0	22 30 7.79	2.1553	S. 15 4 11.3	12.785
1	20 46 7.99	2.2724	23 7 30.0	7.535	1	22 32 17.04	2.1532	14 51 25.1	12.814
2	20 48 24.26	2.2700	22 59 54.1	7.663	2	22 34 26.17	2.1512	14 38 33.6	12.902
3	20 50 40.39	2.2677	22 52 10.5	7.791	3	22 36 35.18	2.1493	14 25 36.9	12.988
4	20 52 56.38	2.2653	22 44 19.2	7.918	4	22 38 44.08	2.1473	14 12 35.0	13.075
5	20 55 12.22	2.2628	22 36 20.4	8.043	5	22 40 52.86	2.1455	13 59 27.9	13.160
6	20 57 27.92	2.2604	22 28 14.0	8.169	6	22 43 1.54	2.1437	13 46 15.8	13.243
7	20 59 43.47	2.2579	22 20 0.1	8.294	7	22 45 10.10	2.1419	13 32 58.7	13.327
8	21 1 58.87	2.2554	22 11 38.7	8.418	8	22 47 18.56	2.1402	13 19 36.6	13.408
9	21 4 14.12	2.2528	22 3 9.9	8.542	9	22 49 26.92	2.1385	13 6 9.7	13.489
10	21 6 29.21	2.2503	21 54 33.7	8.664	10	22 51 35.18	2.1369	12 52 37.9	13.570
11	21 8 44.15	2.2477	21 45 50.2	8.787	11	22 53 43.35	2.1353	12 39 1.3	13.648
12	21 10 58.93	2.2451	21 36 59.3	8.908	12	22 55 51.42	2.1338	12 25 20.1	13.725
13	21 13 13.56	2.2425	21 28 1.2	9.028	13	22 57 59.40	2.1323	12 11 34.3	13.802
14	21 15 28.03	2.2398	21 18 55.9	9.148	14	23 0 7.30	2.1310	11 57 43.9	13.878
15	21 17 42.34	2.2373	21 9 43.4	9.268	15	23 2 15.12	2.1296	11 43 49.0	13.953
16	21 19 56.50	2.2347	21 0 23.8	9.386	16	23 4 22.85	2.1283	11 29 49.6	14.026
17	21 22 10.50	2.2320	20 50 57.1	9.503	17	23 6 30.51	2.1271	11 15 45.9	14.098
18	21 24 24.34	2.2293	20 41 23.4	9.620	18	23 8 38.10	2.1259	11 1 37.8	14.170
19	21 26 38.02	2.2267	20 31 42.7	9.736	19	23 10 45.62	2.1248	10 47 25.5	14.240
20	21 28 51.54	2.2240	20 21 55.1	9.852	20	23 12 53.07	2.1238	10 33 9.0	14.309
21	21 31 4.90	2.2213	20 12 0.5	9.967	21	23 15 0.47	2.1228	10 18 48.4	14.377
22	21 33 18.10	2.2188	20 1 59.1	10.080	22	23 17 7.81	2.1218	10 4 23.8	14.443
23	21 35 31.15	2.2162	S. 19 51 50.9	10.193	23	23 19 15.09	2.1209	S. 9 49 55.2	14.509
MONDAY 30.					WEDNESDAY, JUNE 1.				
0	21 37 44.04	2.2135	S. 19 41 36.0	10.304	0	23 21 22.32	2.1202	S. 9 35 22.7	14.573
1	21 39 56.77	2.2108	19 31 14.4	10.416	PHASES OF THE MOON.				
2	21 42 9.33	2.2081	19 20 46.1	10.526					
3	21 44 21.74	2.2056	19 10 11.3	10.635	<div><div>☾</div>Last Quarter . . . . . May 2 1 29.6</div> <div><div>●</div>New Moon . . . . . 8 17 32.9</div> <div><div>☽</div>First Quarter . . . . . 15 14 13.1</div> <div><div>○</div>Full Moon . . . . . 23 17 39.1</div> <div><div>☾</div>Last Quarter . . . . . 31 10 24.5</div>				
4	21 46 34.00	2.2029	18 59 29.9	10.744					
5	21 48 46.09	2.2003	18 48 42.0	10.852					
6	21 50 58.03	2.1978	18 37 47.7	10.958					
7	21 53 9.82	2.1952	18 26 47.0	11.064	<div><div>☾</div>Perigee . . . . . May 8 7.4</div> <div><div>☾</div>Apogee . . . . . 21 6.6</div>				
8	21 55 21.45	2.1926	18 15 40.0	11.169					
9	21 57 32.93	2.1901	18 4 26.7	11.274					
10	21 59 44.26	2.1876	17 53 7.1	11.378					
11	22 1 55.44	2.1851	17 41 41.4	11.479					
12	22 4 6.47	2.1826	17 30 9.6	11.581					
13	22 6 17.35	2.1801	17 18 31.7	11.682					
14	22 8 28.08	2.1777	17 6 47.8	11.781					
15	22 10 38.67	2.1753	16 54 58.0	11.879					
16	22 12 49.12	2.1730	16 43 2.3	11.977					
17	22 14 59.43	2.1707	16 31 0.7	12.074					
18	22 17 9.60	2.1683	16 18 53.4	12.169					
19	22 19 19.63	2.1660	16 6 40.4	12.264					
20	22 21 29.52	2.1638	15 54 21.7	12.358					
21	22 23 39.28	2.1616	15 41 57.4	12.452					
22	22 25 48.91	2.1594	15 29 27.5	12.544					
23	22 27 58.41	2.1573	15 16 52.1	12.635					
24	22 30 7.79	2.1553	S. 15 4 11.3	12.725					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	JUPITER W.	111 26 27	2706	113 2 59	2692	114 39 50	2678	116 16 59	2664
	Spica W.	94 40 25	2748	96 16 1	2734	97 51 56	2720	99 28 9	2705
	Antares W.	48 46 14	2745	50 21 55	2731	51 57 54	2716	53 34 12	2701
	SUN E.	102 44 9	3073	101 15 27	3058	99 46 26	3043	98 17 6	3027
2	Spica W.	107 34 11	2630	109 12 25	2615	110 51 0	2599	112 29 56	2583
	Antares W.	61 40 56	2622	63 19 20	2606	64 58 7	2589	66 37 17	2573
	SUN E.	90 45 26	2944	89 14 3	2927	87 42 19	2909	86 10 12	2891
3	Antares W.	74 58 53	2487	76 40 24	2470	78 22 19	2453	80 4 38	2436
	α Aquilæ W.	41 10 42	2439	42 5 50	2422	43 3 31	2404	44 3 37	2388
	SUN E.	78 23 51	2801	76 49 24	2782	75 14 33	2763	73 39 17	2744
4	Antares W.	88 42 26	2348	90 27 15	2332	92 12 28	2315	93 58 6	2298
	α Aquilæ W.	49 36 7	2370	50 48 16	2352	52 2 4	2332	53 17 25	2312
	SUN E.	65 36 46	2652	63 59 1	2634	62 20 52	2615	60 42 17	2597
5	Antares W.	102 52 23	2216	104 40 26	2201	106 28 53	2186	108 17 42	2171
	α Aquilæ W.	59 54 53	2357	61 17 59	2340	62 42 10	2322	64 7 22	2304
	SUN E.	52 23 14	2509	50 42 13	2492	49 0 49	2476	47 19 2	2460
6	α Aquilæ W.	71 26 21	3009	72 56 23	2992	74 27 3	2975	75 58 18	2958
	SUN E.	38 44 41	2387	37 0 47	2374	35 16 35	2362	33 32 5	2350
10	SUN W.	17 55 16	2338	19 40 20	2349	21 25 8	2361	23 9 39	2373
	Regulus E.	81 43 59	2060	79 51 58	2072	78 0 15	2083	76 8 50	2095
	JUPITER E.	118 28 49	2031	116 36 3	2042	114 43 35	2054	112 51 24	2066
11	SUN W.	31 47 35	2443	33 30 8	2460	35 12 18	2477	36 54 4	2493
	Regulus E.	66 56 41	2165	65 7 21	2181	63 18 24	2197	61 29 52	2213
	JUPITER E.	103 35 22	2133	101 45 14	2148	99 55 28	2164	98 6 5	2180
	Spica E.	121 0 0	2170	119 10 47	2184	117 21 55	2199	115 33 26	2214
12	SUN W.	45 16 53	2584	46 56 10	2602	48 35 2	2621	50 13 28	2641
	Regulus E.	52 33 35	2304	50 47 41	2323	49 2 14	2342	47 17 15	2362
	JUPITER E.	89 5 24	2265	87 18 33	2283	85 32 8	2301	83 46 9	2319
	Spica E.	106 36 54	2197	104 50 50	2215	103 5 12	2233	101 20 0	2250
13	SUN W.	58 18 58	2741	59 54 44	2761	61 30 4	2781	63 4 57	2801
	Regulus E.	38 39 39	2467	36 57 39	2488	35 16 9	2511	33 35 11	2535
	JUPITER E.	75 2 59	2412	73 19 42	2431	71 36 51	2450	69 54 27	2469
	Spica E.	92 40 30	2442	90 57 56	2461	89 15 47	2480	87 34 5	2499
14	SUN W.	70 52 54	2900	72 25 13	2919	73 57 8	2938	75 28 38	2957
	MARS W.	25 57 47	2793	27 32 24	2811	29 6 37	2829	30 40 27	2846
	JUPITER E.	61 29 4	2562	59 49 17	2580	58 9 55	2598	56 30 58	2616
	Spica E.	79 12 7	2591	77 33 0	2610	75 54 18	2628	74 16 1	2646
15	SUN W.	83 0 19	3048	84 29 32	3065	85 58 23	3082	87 26 54	3099
	MARS W.	38 24 5	2932	39 55 43	2949	41 26 59	2965	42 57 55	2981
	Pollux W.	24 40 41	2732	26 16 39	2746	27 52 18	2760	29 27 38	2774
	JUPITER E.	48 22 12	2703	46 45 37	2719	45 9 23	2736	43 33 31	2753



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	JUPITER	W.	117 54 27	2649	119 32 15	2635	121 10 22	2620	122 48 50	2605
	Spica	W.	101 4 42	2691	102 41 34	2676	104 18 46	2661	105 56 18	2646
	Antares	W.	55 10 51	2685	56 47 51	2670	58 25 11	2654	60 2 53	2638
	SUN	E.	96 47 27	3011	95 17 28	2994	93 47 8	2977	92 16 27	2962
2	Spica	W.	114 9 14	2567	115 48 54	2551	117 28 56	2535	119 9 20	2518
	Antares	W.	68 16 49	2556	69 56 45	2539	71 37 4	2522	73 17 47	2505
	SUN	E.	84 37 42	2873	83 4 49	2855	81 31 33	2837	79 57 54	2819
3	Antares	W.	81 47 22	2418	83 30 31	2401	85 14 4	2384	86 58 2	2366
	α Aquilæ	W.	45 6 0	4454	46 10 33	4318	47 17 9	4192	48 25 43	4077
	SUN	E.	72 3 37	2725	70 27 31	2707	68 51 1	2689	67 14 6	2670
4	Antares	W.	95 44 9	2281	97 30 36	2264	99 17 28	2248	101 4 44	2232
	α Aquilæ	W.	54 34 15	3619	55 52 29	3545	57 12 3	3477	58 32 53	3415
	SUN	E.	59 3 18	2579	57 23 54	2561	55 44 5	2543	54 3 51	2526
5	Antares	W.	110 6 53	2157	111 56 26	2143	113 46 19	2130	115 36 33	2116
	α Aquilæ	W.	65 33 30	3158	67 0 30	3115	68 28 21	3077	69 56 59	3042
	SUN	E.	45 36 53	2445	43 54 22	2430	42 11 29	2415	40 28 15	2401
6	α Aquilæ	W.	77 30 6	2902	79 2 22	2882	80 35 4	2863	82 8 11	2844
	SUN	E.	31 47 19	2339	30 2 16	2328	28 16 58	2318	26 31 26	2309
10	SUN	W.	24 53 53	2386	26 37 48	2399	28 21 24	2413	30 4 40	2428
	Regulus	E.	74 17 43	2108	72 26 56	2122	70 36 29	2136	68 46 24	2150
	JUPITER	E.	110 59 32	2078	109 7 59	2091	107 16 46	2104	105 25 53	2118
11	SUN	W.	38 35 27	2510	40 16 26	2528	41 57 0	2546	43 37 9	2565
	Regulus	E.	59 41 44	2231	57 54 2	2248	56 6 46	2266	54 19 57	2285
	JUPITER	E.	96 17 7	2196	94 28 34	2213	92 40 25	2230	90 52 42	2247
	Spica	E.	113 45 20	2230	111 57 37	2246	110 10 18	2263	108 23 24	2280
12	SUN	W.	51 51 27	2661	53 29 0	2681	55 6 6	2701	56 42 45	2721
	Regulus	E.	45 32 45	2382	43 48 44	2402	42 5 12	2423	40 22 10	2445
	JUPITER	E.	82 0 37	2337	80 15 32	2356	78 30 54	2375	76 46 43	2394
	Spica	E.	99 35 13	2368	97 50 53	2387	96 6 59	2405	94 23 31	2424
13	SUN	W.	64 39 24	2821	66 13 25	2841	67 47 0	2860	69 20 10	2880
	Regulus	E.	31 54 46	2559	30 14 54	2584	28 35 36	2609	26 56 53	2635
	JUPITER	E.	68 12 30	2488	66 30 59	2507	64 49 55	2525	63 9 17	2543
	Spica	E.	85 52 50	2517	84 12 1	2535	82 31 37	2554	80 51 39	2573
14	SUN	W.	76 59 45	2976	78 30 28	2994	80 0 48	3013	81 30 45	3031
	MARS	W.	32 13 56	2863	33 47 2	2881	35 19 45	2898	36 52 6	2915
	JUPITER	E.	54 52 25	2634	53 14 17	2652	51 36 32	2669	49 59 10	2687
	Spica	E.	72 38 8	2663	71 0 39	2681	69 23 33	2698	67 46 51	2715
15	SUN	W.	88 55 4	3116	90 22 54	3132	91 50 25	3148	93 17 37	3163
	MARS	W.	44 28 32	2997	45 58 49	3012	47 28 47	3027	48 58 26	3042
	Pollux	W.	31 2 40	2788	32 37 24	2801	34 11 50	2815	35 45 59	2828
	JUPITER	E.	41 58 1	2769	40 22 52	2784	38 48 3	2800	37 13 35	2815

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
15	Spica E.	66 10 31	2732	64 34 34	2749	62 58 59	2766	61 23 46	2782
	Antares E.	112 3 0	2722	110 26 49	2737	108 50 58	2753	107 15 28	2768
16	SUN W.	94 44 30	3178	96 11 6	3192	97 37 24	3206	99 3 26	3220
	MARS W.	50 27 47	3056	51 56 50	3070	53 25 36	3083	54 54 6	3097
	Pollux W.	37 19 51	2841	38 53 26	2854	40 26 44	2866	41 59 46	2878
	JUPITER E.	35 39 26	2830	34 5 36	2845	32 32 6	2859	30 58 55	2873
	Spica E.	53 32 51	2858	51 59 39	2873	50 26 45	2887	48 54 10	2901
	Antares E.	99 22 51	2840	97 49 15	2853	96 15 56	2866	94 42 53	2879
17	SUN W.	106 9 42	3282	107 34 14	3293	108 58 33	3303	110 22 40	3313
	MARS W.	62 12 42	3157	63 39 43	3168	65 6 31	3178	66 33 6	3188
	Pollux W.	49 41 12	2934	51 12 48	2944	52 44 11	2954	54 15 22	2963
	Spica E.	41 15 39	2969	39 44 47	2982	38 14 12	2995	36 43 53	3008
	Antares E.	87 1 34	2936	85 30 1	2946	83 58 41	2956	82 27 34	2965
18	SUN W.	117 20 28	3359	118 43 31	3366	120 6 26	3374	121 29 12	3381
	MARS W.	73 43 15	3231	75 8 47	3239	76 34 10	3246	77 59 24	3253
	Pollux W.	61 48 32	3003	63 18 40	3010	64 48 40	3017	66 18 32	3023
	Regulus W.	25 50 45	3077	27 19 23	3077	28 48 1	3077	30 16 39	3078
	Spica E.	29 16 22	3076	27 47 43	3092	26 19 23	3108	24 51 23	3126
	Antares E.	74 54 46	3008	73 24 43	3015	71 54 49	3022	70 25 4	3028
	α Aquilæ E.	118 22 16	4103	117 12 17	4081	116 1 57	4060	114 51 16	4041
19	MARS W.	85 3 48	3280	86 28 23	3285	87 52 52	3289	89 17 16	3293
	Pollux W.	73 46 3	3049	75 15 14	3053	76 44 21	3056	78 13 24	3059
	Regulus W.	37 39 26	3085	39 7 53	3087	40 36 19	3088	42 4 43	3090
	Antares E.	62 58 9	3056	61 29 6	3060	60 0 8	3064	58 31 15	3068
	α Aquilæ E.	108 53 42	3967	107 41 30	3956	106 29 7	3946	105 16 34	3937
20	MARS W.	96 18 21	3306	97 42 25	3307	99 6 28	3309	100 30 29	3310
	Pollux W.	85 37 41	3072	87 6 24	3074	88 35 5	3075	90 3 45	3076
	Regulus W.	49 26 17	3055	50 54 33	3056	52 22 48	3056	53 51 3	3056
	JUPITER W.	13 15 3	3141	14 42 23	3149	16 9 57	3150	17 37 42	3112
	Antares E.	51 7 53	3083	49 39 23	3085	48 10 56	3087	46 42 31	3089
	α Aquilæ E.	99 11 47	3904	97 58 31	3899	96 45 10	3895	95 31 45	3892
21	MARS W.	107 30 22	3312	108 54 20	3311	110 18 19	3310	111 42 19	3309
	Pollux W.	97 26 52	3078	98 55 29	3077	100 24 7	3076	101 52 46	3074
	Regulus W.	61 12 20	3093	62 40 38	3092	64 8 57	3091	65 37 18	3089
	JUPITER W.	24 58 27	3087	26 26 52	3085	27 55 20	3082	29 23 52	3079
	Antares E.	39 20 54	3096	37 52 39	3096	36 24 25	3097	34 56 12	3098
	α Aquilæ E.	89 24 7	3887	88 10 33	3887	86 57 0	3888	85 43 28	3890
22	Pollux W.	109 16 28	3066	110 45 19	3064	112 14 12	3062	113 43 8	3059
	Regulus W.	72 59 36	3078	74 28 12	3076	75 56 51	3073	77 25 33	3070
	JUPITER W.	36 47 23	3065	38 16 16	3061	39 45 13	3058	41 14 14	3055
	Spica W.	19 19 1	3214	20 44 53	3193	22 11 10	3174	23 37 49	3158
	α Aquilæ E.	79 36 34	3912	78 23 26	3919	77 10 25	3926	75 57 32	3934
	Fomalhaut E.	110 7 9	3252	108 42 1	3247	107 16 47	3241	105 51 26	3236
23	Regulus W.	84 50 1	3053	86 19 8	3050	87 48 19	3046	89 17 35	3042

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
15	Spica E. Antares E.	59 48 54 105 40 18	2798 2783	58 14 23 104 5 28	2813 2798	56 40 13 102 30 57	2828 2812	55 6 22 100 56 45	2844 2826
16	SUN W. MARS W. Pollux W. JUPITER E. Spica E. Antares E.	100 29 12 56 22 19 43 32 32 29 26 2 47 21 53 93 10 7	3233 3110 2890 2888 2915 2891	101 54 42 57 50 17 45 5 3 27 53 28 45 49 54 91 37 36	3246 3122 2901 2902 2929 2903	103 19 57 59 17 59 46 37 20 26 21 12 44 18 12 90 5 21	3259 3134 2912 2916 2942 2914	104 44 57 60 45 27 48 9 23 24 49 14 42 46 47 88 33 21	3271 3145 2923 2931 2956 2925
17	SUN W. MARS W. Pollux W. Spica E. Antares E.	111 46 36 67 59 30 55 46 21 35 13 50 80 56 38	3323 3198 2972 3021 2975	113 10 20 69 25 42 57 17 9 33 44 3 79 25 54	3333 3207 2980 3034 2984	114 33 53 70 51 43 58 47 47 32 14 33 77 55 21	3342 3215 2988 3047 2992	115 57 15 72 17 34 60 18 14 30 45 19 76 24 59	3351 3223 2996 3061 3000
18	SUN W. MARS W. Pollux W. Regulus W. Spica E. Antares E. α Aquilæ E.	122 51 50 79 24 31 67 48 16 31 45 16 23 23 44 68 55 26 113 40 17	3387 3259 3029 3079 3146 3034 4024	124 14 21 80 49 30 69 17 53 33 13 51 21 56 29 67 25 56 112 29 1	3394 3265 3034 3081 3168 3040 4008	125 36 44 82 14 22 70 47 23 34 42 24 20 29 42 65 56 34 111 17 29	3400 3270 3040 3082 3193 3046 3993	126 59 1 83 39 8 72 16 46 36 10 56 19 3 25 64 27 18 110 5 42	3404 3275 3045 3083 3220 3051 3979
19	MARS W. Pollux W. Regulus W. Antares E. α Aquilæ E.	90 41 36 79 42 22 43 33 5 57 2 26 104 3 52	3296 3063 3091 3072 3928	92 5 52 81 11 16 45 1 25 55 33 42 102 51 1	3299 3066 3092 3075 3921	93 30 5 82 40 7 46 29 44 54 5 2 101 38 3	3302 3068 3093 3078 3915	94 54 14 84 8 55 47 58 1 52 36 26 100 24 58	3304 3070 3094 3081 3909
20	MARS W. Pollux W. Regulus W. JUPITER W. Antares E. α Aquilæ E.	101 54 29 91 32 23 55 19 18 19 5 37 45 14 8 94 18 17	3311 3077 3096 3105 3091 3889	103 18 28 93 1 1 56 47 33 20 33 40 43 45 47 93 4 46	3312 3078 3096 3099 3092 3888	104 42 26 94 29 38 58 15 48 22 1 51 42 17 28 91 51 14	3312 3078 3095 3095 3093 3887	106 6 24 95 58 15 59 44 4 23 30 7 40 49 10 90 37 41	3312 3078 3094 3091 3095 3886
21	MARS W. Pollux W. Regulus W. JUPITER W. Antares E. α Aquilæ E.	113 6 20 103 21 27 67 5 41 30 52 27 33 28 0 84 29 58	3307 3073 3087 3076 3099 3893	114 30 23 104 50 9 68 34 6 32 21 6 31 59 49 83 16 31	3306 3072 3085 3073 3100 3896	115 54 27 106 18 53 70 2 33 33 49 48 30 31 39 82 3 7	3304 3070 3083 3070 3101 3901	117 18 33 107 47 39 71 31 3 35 18 34 29 3 31 80 49 48	3302 3068 3081 3068 3102 3906
22	Pollux W. Regulus W. JUPITER W. Spica W. α Aquilæ E. Fomalhaut E.	115 12 8 78 54 19 42 43 19 25 4 48 74 44 47 104 25 59	3056 3067 3052 3144 3944 3231	116 41 11 80 23 8 44 12 28 26 32 4 73 32 12 103 0 26	3053 3064 3048 3133 3955 3225	118 10 18 81 52 1 45 41 41 27 59 34 72 19 47 101 34 46	3050 3060 3044 3122 3967 3220	119 39 29 83 20 59 47 10 59 29 27 17 71 7 35 100 9 1	3047 3057 3040 3112 3980 3214
23	Regulus W.	90 46 56	3038	92 16 22	3033	93 45 54	3029	95 15 31	3024

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
23	JUPITER	W.	48 40 22	3037	50 9 49	3033	51 39 21	3029	53 8 58	3024
	Spica	W.	30 55 13	3102	32 23 20	3093	33 51 38	3085	35 20 6	3077
	α Aquilæ	E.	69 55 36	3995	68 43 52	4011	67 32 23	4028	66 21 11	4048
	Fomalhaut	E.	98 43 9	3209	97 17 11	3205	95 51 8	3200	94 24 59	3195
	α Pegasi	E.	116 52 16	3547	115 32 44	3532	114 12 55	3516	112 52 49	3501
24	Regulus	W.	96 45 14	3019	98 15 3	3015	99 44 57	3010	101 14 57	3005
	JUPITER	W.	60 38 26	3001	62 8 37	2997	63 38 54	2992	65 9 17	2986
	Spica	W.	42 44 47	3041	44 14 9	3031	45 43 39	3027	47 13 18	3020
	α Aquilæ	E.	60 30 32	4174	59 21 41	4206	58 13 21	4241	57 5 34	4280
	Fomalhaut	E.	87 12 51	3173	85 46 9	3169	84 19 23	3164	82 52 31	3160
	α Pegasi	E.	106 8 27	3438	104 46 54	3427	103 25 8	3417	102 3 11	3407
25	Regulus	W.	108 46 36	2978	110 17 16	2973	111 48 3	2967	113 18 57	2961
	JUPITER	W.	72 42 54	2959	74 13 58	2953	75 45 10	2947	77 16 30	2941
	Spica	W.	54 43 40	2986	56 14 10	2980	57 44 48	2973	59 15 35	2966
	Fomalhaut	E.	75 37 2	3142	74 9 43	3139	72 42 21	3136	71 14 55	3133
	α Pegasi	E.	95 10 44	3365	93 47 47	3357	92 24 41	3350	91 1 27	3343
26	JUPITER	W.	84 55 7	2908	86 27 16	2901	87 59 33	2894	89 31 59	2887
	Spica	W.	66 51 42	2930	68 23 23	2923	69 55 13	2915	71 27 13	2907
	Antares	W.	21 2 13	2971	22 33 2	2958	24 4 7	2945	25 35 29	2933
	Fomalhaut	E.	63 57 0	3123	62 29 18	3122	61 1 35	3122	59 33 52	3121
	α Pegasi	E.	84 3 29	3316	82 39 36	3312	81 15 38	3308	79 51 36	3305
27	JUPITER	W.	97 16 33	2849	98 49 57	2841	100 23 32	2832	101 57 18	2824
	Spica	W.	79 9 43	2867	80 42 45	2859	82 15 57	2850	83 49 20	2841
	Antares	W.	33 16 5	2876	34 48 54	2866	36 21 56	2856	37 55 11	2845
	Fomalhaut	E.	52 15 28	3131	50 47 56	3136	49 20 30	3142	47 53 10	3148
	α Pegasi	E.	72 50 37	3295	71 26 20	3295	70 2 3	3296	68 37 47	3298
	α Arietis	E.	114 47, 27	2963	113 16 28	2952	111 45 14	2941	110 13 47	2930
28	JUPITER	W.	109 48 55	2780	111 23 49	2770	112 58 56	2760	114 34 16	2751
	Spica	W.	91 39 9	2795	93 13 43	2785	94 48 29	2775	96 23 29	2766
	Antares	W.	45 44 47	2795	47 19 22	2784	48 54 11	2773	50 29 14	2763
	α Pegasi	E.	61 37 10	3319	60 13 20	3327	58 49 39	3336	57 26 9	3346
	α Arietis	E.	102 33 6	2876	101 0 17	2866	99 27 14	2855	97 53 57	2845
	SUN	E.	131 42 9	3119	130 14 22	3109	128 46 23	3098	127 18 11	3087
29	Spica	W.	104 21 44	2714	105 58 5	2703	107 34 40	2692	109 11 31	2681
	Antares	W.	58 28 3	2707	60 4 33	2695	61 41 19	2684	63 18 20	2672
	α Pegasi	E.	50 32 30	3433	49 10 51	3459	47 49 41	3488	46 29 4	3522
	α Arietis	E.	90 4 5	2790	88 29 24	2779	86 54 28	2768	85 19 18	2757
	SUN	E.	119 53 47	3030	118 24 11	3018	116 54 21	3006	115 24 15	2993
30	Antares	W.	71 27 29	2611	73 6 9	2598	74 45 7	2585	76 24 22	2572
	α Arietis	E.	77 19 47	2701	75 43 8	2690	74 6 15	2679	72 29 7	2668
	SUN	E.	107 49 49	2929	106 18 6	2916	104 46 7	2902	103 13 50	2887
31	Antares	W.	84 45 9	2506	86 26 14	2492	88 7 38	2478	89 49 22	2464
	α Arietis	E.	64 19 48	2615	62 41 14	2605	61 2 26	2596	59 23 25	2586
	SUN	E.	95 27 52	2816	93 53 45	2801	92 19 19	2787	90 44 34	2772

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
23	JUPITER	W.	54 38 41	3020	56 8 29	3016	57 38 22	3011	59 8 21	3006
	Spica	W.	36 48 44	3069	38 17 31	3062	39 46 28	3055	41 15 33	3048
	α Aquilæ	E.	65 10 19	4069	63 59 47	4097	62 49 37	4117	61 39 51	4144
	Fomalhaut	E.	92 58 44	3191	91 32 24	3186	90 5 58	3182	88 39 27	3178
	α Pegasi	E.	111 32 26	3487	110 11 48	3474	108 50 55	3462	107 29 48	3450
24	Regulus	W.	102 45 4	3000	104 15 17	2995	105 45 36	2989	107 16 3	2984
	JUPITER	W.	66 39 47	2981	68 10 23	2976	69 41 6	2970	71 11 56	2964
	Spica	W.	48 43 6	3014	50 13 2	3007	51 43 6	3000	53 13 19	2993
	α Aquilæ	E.	55 58 23	4322	54 51 51	4368	53 46 1	4418	52 40 56	4474
	Fomalhaut	E.	81 25 34	3157	79 58 33	3153	78 31 27	3149	77 4 17	3145
	α Pegasi	E.	100 41 2	3398	99 18 43	3388	97 56 13	3379	96 33 33	3372
25	Regulus	W.	114 49 59	2955	116 21 8	2949	117 52 25	2943	119 23 49	2938
	JUPITER	W.	78 47 57	2935	80 19 32	2928	81 51 15	2921	83 23 7	2915
	Spica	W.	60 46 30	2959	62 17 35	2952	63 48 48	2945	65 20 10	2937
	Fomalhaut	E.	69 47 26	3131	68 19 53	3129	66 52 18	3126	65 24 40	3124
	α Pegasi	E.	89 38 5	3337	88 14 36	3331	86 51 0	3325	85 27 17	3320
26	JUPITER	W.	91 4 35	2880	92 37 20	2873	94 10 14	2865	95 43 18	2857
	Spica	W.	72 59 23	2899	74 31 43	2891	76 4 12	2883	77 36 52	2875
	Antares	W.	27 7 6	2921	28 38 59	2909	30 11 7	2898	31 43 29	2887
	Fomalhaut	E.	58 6 8	3122	56 38 25	3124	55 10 43	3126	53 43 4	3128
	α Pegasi	E.	78 27 30	3302	77 3 20	3300	75 39 8	3298	74 14 53	3296
27	JUPITER	W.	103 31 15	2815	105 5 23	2807	106 39 42	2798	108 14 13	2789
	Spica	W.	85 22 55	2832	86 56 41	2824	88 30 38	2815	90 4 47	2805
	Antares	W.	39 28 40	2835	41 2 22	2825	42 36 17	2815	44 10 25	2805
	Fomalhaut	E.	46 25 59	3157	44 58 58	3168	43 32 10	3180	42 5 37	3193
	α Pegasi	E.	67 13 32	3300	65 49 19	3303	64 25 11	3307	63 1 8	3312
	α Arietis	E.	108 42 6	2920	107 10 12	2909	105 38 4	2898	104 5 42	2887
28	JUPITER	W.	116 9 48	2741	117 45 34	2731	119 21 32	2721	120 57 44	2710
	Spica	W.	97 58 41	2756	99 34 6	2746	101 9 45	2735	102 45 38	2725
	Antares	W.	52 4 31	2752	53 40 2	2741	55 15 48	2730	56 51 48	2719
	α Pegasi	E.	56 2 51	3359	54 39 48	3374	53 17 2	3391	51 54 35	3410
	α Arietis	E.	96 20 27	2834	94 46 43	2823	93 12 45	2812	91 38 32	2801
	SUN	E.	125 49 46	3076	124 21 7	3065	122 52 15	3053	121 23 8	3042
29	Spica	W.	110 48 36	2670	112 25 57	2659	114 3 32	2647	115 41 23	2636
	Antares	W.	64 55 37	2660	66 33 10	2648	68 11 0	2636	69 49 6	2624
	α Pegasi	E.	45 9 4	3561	43 49 47	3606	42 31 19	3657	41 13 46	3713
	α Arietis	E.	83 43 53	2746	82 8 14	2735	80 32 20	2723	78 56 11	2712
	SUN	E.	113 53 54	2981	112 23 17	2968	110 52 24	2955	109 21 15	2942
30	Antares	W.	78 3 55	2559	79 43 46	2546	81 23 55	2533	83 4 23	2520
	α Arietis	E.	70 51 44	2657	69 14 7	2646	67 36 15	2636	65 58 9	2625
	SUN	E.	101 41 14	2873	100 8 21	2859	98 35 10	2845	97 1 40	2831
31	Antares	W.	91 31 25	2450	93 13 48	2437	94 56 30	2423	96 39 32	2409
	α Arietis	E.	57 44 11	2577	56 4 45	2569	54 25 7	2562	52 45 19	2555
	SUN	E.	89 9 29	2757	87 34 5	2742	85 58 21	2727	84 22 17	2713

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from	
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Added to Apparent Time.		Diff. for 1 Hour.	
Wed.	1	h m s	s	° ' "	"	' "	s	m s	s	
Thur.	2	4 33 50.08	10.222	N.21 58 29.4	+ 20.99	15 48.02	68.34	2 31.02	0.365	
Frid.	3	4 37 55.62	10.239	22 6 42.1	20.04	15 47.87	68.40	2 22.06	0.382	
		4 42 1.58	10.256	22 14 31.8	19.07	15 47.73	68.46	2 12.67	0.399	
Sat.	4	4 46 7.95	10.272	22 21 58.2	+ 18.10	15 47.59	68.51	2 2.88	0.415	
SUN.	5	4 50 14.70	10.287	22 29 1.1	17.12	15 47.46	68.56	1 52.73	0.430	
Mon.	6	4 54 21.80	10.301	22 35 40.5	16.14	15 47.34	68.60	1 42.23	0.445	
Tues.	7	4 58 29.23	10.314	22 41 56.2	+ 15.15	15 47.22	68.65	1 31.38	0.458	
Wed.	8	5 2 36.96	10.327	22 47 48.1	14.15	15 47.11	68.69	1 20.22	0.470	
Thur.	9	5 6 44.97	10.338	22 53 15.9	13.14	15 47.00	68.73	1 8.79	0.481	
Frid.	10	5 10 53.24	10.349	22 58 19.4	+ 12.13	15 46.90	68.76	0 57.11	0.491	
Sat.	11	5 15 1.74	10.358	23 2 58.6	11.12	15 46.80	68.79	0 45.21	0.500	
SUN.	12	5 19 10.45	10.367	23 7 13.5	10.10	15 46.72	68.82	0 33.10	0.508	
Mon.	13	5 23 19.34	10.374	23 11 4.1	+ 9.08	15 46.62	68.85	0 20.80	0.515	
Tues.	14	5 27 28.38	10.380	23 14 30.0	8.05	15 46.54	68.87	0 8.35	0.521	
Wed.	15	5 31 37.56	10.385	23 17 31.2	7.02	15 46.46	68.89	0 4.23	0.526	
Thur.	16	5 35 46.85	10.389	23 20 7.7	+ 6.00	15 46.38	68.91	0 16.93	0.531	
Frid.	17	5 39 56.24	10.392	23 22 19.6	4.97	15 46.31	68.92	0 29.73	0.534	
Sat.	18	5 44 5.70	10.395	23 24 6.7	3.94	15 46.24	68.93	0 42.60	0.537	
SUN.	19	5 48 15.21	10.396	23 25 28.9	+ 2.91	15 46.18	68.94	0 55.51	0.538	
Mon.	20	5 52 24.75	10.396	23 26 26.4	1.87	15 46.12	68.94	1 8.45	0.539	
Tues.	21	5 56 34.29	10.396	23 26 59.2	+ 0.84	15 46.07	68.95	1 21.39	0.539	
Wed.	22	6 0 43.82	10.395	23 27 7.2	- 0.19	15 46.02	68.95	1 34.32	0.538	
Thur.	23	6 4 53.31	10.393	23 26 50.4	1.22	15 45.97	68.94	1 47.22	0.536	
Frid.	24	6 9 2.75	10.390	23 26 8.8	2.25	15 45.92	68.93	2 0.07	0.533	
Sat.	25	6 13 12.11	10.387	23 25 2.4	- 3.28	15 45.88	68.92	2 12.84	0.529	
SUN.	26	6 17 21.38	10.382	23 23 31.4	4.31	15 45.84	68.90	2 25.52	0.525	
Mon.	27	6 21 30.53	10.377	23 21 35.7	5.34	15 45.80	68.88	2 38.09	0.520	
Tues.	28	6 25 39.55	10.371	23 19 15.4	- 6.36	15 45.76	68.86	2 50.52	0.515	
Wed.	29	6 29 48.43	10.365	23 16 30.5	7.39	15 45.73	68.83	3 2.80	0.508	
Thur.	30	6 33 57.14	10.357	23 13 21.2	8.40	15 45.71	68.80	3 14.92	0.500	
Frid.	31	6 38 5.64	10.349	N.23 9 47.5	- 9.41	15 45.69	68.76	3 26.85	0.491	

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.19 from the sidereal time. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Subtracted from Mean Time.		
		h m s	s	° ' "	"	m s	s	h m s
Wed.	1	4 33 50.49	10.221	N.21 58 30.3	+20.99	2 31.02	0.365	4 36 21.51
Thur.	2	4 37 56.01	10.239	22 6 42.9	20.04	2 22.05	0.382	4 40 18.06
Frid.	3	4 42 1.95	10.256	22 14 32.4	19.07	2 12.66	0.399	4 44 14.62
Sat.	4	4 46 8.29	10.272	22 21 58.7	+18.10	2 2.88	0.415	4 48 11.18
SUN.	5	4 50 15.01	10.287	22 29 1.6	17.12	1 52.73	0.430	4 52 7.74
Mon.	6	4 54 22.08	10.301	22 35 41.0	16.14	1 42.22	0.445	4 56 4.30
Tues.	7	4 58 29.48	10.314	22 41 56.7	+15.15	1 31.38	0.458	5 0 0.85
Wed.	8	5 2 37.18	10.327	22 47 48.4	14.15	1 20.23	0.470	5 3 57.41
Thur.	9	5 6 45.16	10.338	22 53 16.0	13.14	1 8.80	0.481	5 7 53.96
Frid.	10	5 10 53.40	10.349	22 58 19.5	+12.13	0 57.12	0.491	5 11 50.52
Sat.	11	5 15 1.87	10.358	23 2 58.7	11.12	0 45.21	0.500	5 15 47.08
SUN.	12	5 19 10.54	10.367	23 7 13.6	10.10	0 33.10	0.508	5 19 43.64
Mon.	13	5 23 19.39	10.374	23 11 4.1	+9.08	0 20.81	0.515	5 23 40.20
Tues.	14	5 27 28.40	10.380	23 14 30.0	8.05	0 8.36	0.521	5 27 36.76
Wed.	15	5 31 37.54	10.385	23 17 31.2	7.02	0 4.22	0.526	5 31 33.32
Thur.	16	5 35 46.80	10.389	23 20 7.7	+6.00	0 16.92	0.531	5 35 29.88
Frid.	17	5 39 56.15	10.392	23 22 19.5	4.97	0 29.72	0.534	5 39 26.43
Sat.	18	5 44 5.57	10.395	23 24 6.6	3.94	0 42.58	0.537	5 43 22.99
SUN.	19	5 48 15.04	10.396	23 25 28.9	+2.91	0 55.49	0.538	5 47 19.55
Mon.	20	5 52 24.54	10.396	23 26 26.4	1.87	1 8.43	0.539	5 51 16.11
Tues.	21	5 56 34.05	10.396	23 26 59.2	+0.84	1 21.38	0.539	5 55 12.67
Wed.	22	6 0 43.54	10.395	23 27 7.2	-0.19	1 34.32	0.538	5 59 9.22
Thur.	23	6 4 52.99	10.393	23 26 50.4	1.22	1 47.21	0.536	6 3 5.78
Frid.	24	6 9 2.39	10.390	23 26 8.8	2.25	2 0.05	0.533	6 7 2.34
Sat.	25	6 13 11.72	10.387	23 25 2.5	-3.28	2 12.82	0.529	6 10 58.90
SUN.	26	6 17 20.95	10.382	23 23 31.5	4.31	2 25.49	0.525	6 14 55.46
Mon.	27	6 21 30.06	10.377	23 21 35.9	5.34	2 38.05	0.520	6 18 52.01
Tues.	28	6 25 39.05	10.371	23 19 15.7	-6.36	2 50.48	0.515	6 22 48.57
Wed.	29	6 29 47.90	10.365	23 16 30.9	7.39	3 2.77	0.508	6 26 45.13
Thur.	30	6 33 56.57	10.357	23 13 21.7	8.40	3 14.88	0.500	6 30 41.69
Frid.	31	6 38 5.04	10.349	N.23 9 48.0	-9.41	3 26.80	0.491	6 34 38.24

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
 The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign — indicates that north declinations are decreasing.

Diff. for 1 Hour,  
 + 9'.8565.  
 (Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
		$^{\circ}$ $'$ $''$	$'$ $''$	$''$	$''$			$^h$ $^m$ $^s$
1	152	70 6 0.3	5 54.5	143.72	— 0.77	0.006 1328	+ 27.8	19 20 27.86
2	153	71 3 29.3	3 23.4	143.69	0.69	0.006 1988	27.1	19 16 31.95
3	154	72 0 57.6	0 51.5	143.67	0.58	0.006 2628	26.2	19 12 36.04
4	155	72 58 25.2	58 19.0	143.64	— 0.46	0.006 3246	+ 25.3	19 8 40.13
5	156	73 55 52.1	55 45.7	143.61	0.32	0.006 3841	24.3	19 4 44.21
6	157	74 53 18.3	53 11.7	143.57	0.18	0.006 4412	23.3	19 0 48.30
7	158	75 50 43.7	50 36.9	143.54	— 0.03	0.006 4958	+ 22.3	18 56 52.39
8	159	76 48 8.2	48 1.2	143.50	+ 0.11	0.006 5478	21.2	18 52 56.48
9	160	77 45 31.8	45 24.6	143.47	0.22	0.006 5973	20.1	18 49 0.57
10	161	78 42 54.5	42 47.2	143.43	+ 0.31	0.006 6443	+ 19.1	18 45 4.65
11	162	79 40 16.3	40 8.8	143.39	0.39	0.006 6889	18.1	18 41 8.74
12	163	80 37 37.1	37 29.4	143.35	0.42	0.006 7312	17.2	18 37 12.83
13	164	81 34 57.0	34 49.1	143.31	+ 0.43	0.006 7714	+ 16.3	18 33 16.91
14	165	82 32 15.9	32 7.8	143.27	0.41	0.006 8096	15.5	18 29 21.00
15	166	83 29 33.9	29 25.7	143.23	0.35	0.006 8458	14.7	18 25 25.09
16	167	84 26 51.1	26 42.7	143.19	+ 0.28	0.006 8801	+ 13.9	18 21 29.18
17	168	85 24 7.5	23 58.9	143.17	0.19	0.006 9126	13.2	18 17 33.27
18	169	86 21 23.1	21 14.3	143.14	+ 0.08	0.006 9435	12.5	18 13 37.35
19	170	87 18 38.0	18 29.0	143.11	— 0.03	0.006 9727	+ 11.8	18 9 41.44
20	171	88 15 52.2	15 43.1	143.08	0.15	0.007 0003	11.2	18 5 45.53
21	172	89 13 5.9	12 56.6	143.06	0.27	0.007 0264	10.5	18 1 49.62
22	173	90 10 19.2	10 9.6	143.04	— 0.38	0.007 0510	+ 9.9	17 57 53.71
23	174	91 7 32.0	7 22.3	143.03	0.48	0.007 0741	9.3	17 53 57.79
24	175	92 4 44.5	4 34.6	143.02	0.57	0.007 0958	8.8	17 50 1.88
25	176	93 1 56.8	1 46.7	143.01	— 0.62	0.007 1161	+ 8.2	17 46 5.97
26	177	93 59 8.9	58 58.6	143.01	0.64	0.007 1349	7.5	17 42 10.05
27	178	94 56 21.0	56 10.5	143.01	0.65	0.007 1520	6.7	17 38 14.14
28	179	95 53 33.1	53 22.5	143.01	— 0.61	0.007 1674	+ 5.9	17 34 18.23
29	180	96 50 45.3	50 34.5	143.02	0.56	0.007 1810	5.2	17 30 22.32
30	181	97 47 57.7	47 46.7	143.02	0.47	0.007 1927	4.4	17 26 26.41
31	182	98 45 10.2	44 59.0	143.02	— 0.34	0.007 2023	+ 3.5	17 22 30.50
NOTE.—The numbers in column $\lambda$ correspond to the true equinox of the date; in column $\lambda'$ to the mean equinox of January 0 <sup>d</sup> .0.								
Diff. for 1 Hour, — 9 <sup>s</sup> .8296. (Table II.)								



## GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	15 59.6	16 5.6	58 35.8	+ 1.85	58 57.9	+ 1.82	h m 19 22.9	m 2.02	d 23.3
2	16 11.5	16 17.1	59 19.5	1.76	59 40.0	1.64	20 11.8	2.06	24.3
3	16 22.2	16 26.8	59 58.8	1.48	60 15.5	1.28	21 2.4	2.16	25.3
4	16 30.6	16 33.5	60 29.6	+ 1.04	60 40.5	+ 0.76	21 55.9	2.31	26.3
5	16 35.5	16 36.4	60 47.8	+ 0.44	60 51.1	+ 0.10	22 53.2	2.47	27.3
6	16 36.2	16 34.7	60 50.1	- 0.26	60 44.8	- 0.62	23 54.3	2.61	28.3
7	16 32.1	16 28.4	60 35.3	- 0.95	60 21.8	- 1.28	0	.	29.3
8	16 23.8	16 18.2	60 4.6	1.57	59 44.2	1.81	0 57.8	2.66	0.9
9	16 11.9	16 5.1	59 21.1	2.01	58 56.0	2.15	2 0.9	2.58	1.9
10	15 57.9	15 50.4	58 29.5	- 2.24	58 2.2	- 2.28	3 1.1	2.42	2.9
11	15 43.0	15 35.6	57 34.8	2.27	57 7.8	2.21	3 56.6	2.21	3.9
12	15 28.5	15 21.7	56 41.7	2.12	56 16.9	2.00	4 47.0	2.00	4.9
13	15 15.4	15 9.7	55 53.8	- 1.85	55 32.6	- 1.68	5 33.0	1.84	5.9
14	15 4.5	14 59.9	55 13.5	1.49	54 56.8	1.30	6 15.7	1.72	6.9
15	14 56.0	14 52.7	54 42.4	1.09	54 30.5	0.89	6 56.4	1.67	7.9
16	14 50.2	14 48.3	54 21.1	- 0.68	54 14.1	- 0.48	7 36.3	1.66	8.9
17	14 47.0	14 46.4	54 9.5	- 0.29	54 7.1	- 0.11	8 16.4	1.69	9.9
18	14 46.3	14 46.8	54 6.9	+ 0.07	54 8.8	+ 0.23	8 57.9	1.77	10.9
19	14 47.8	14 49.3	54 12.5	+ 0.38	54 17.9	+ 0.52	9 41.6	1.88	11.9
20	14 51.2	14 53.5	54 24.9	0.64	54 33.4	0.76	10 28.2	2.01	12.9
21	14 56.1	14 59.0	54 43.0	0.85	54 53.7	0.93	11 17.8	2.13	13.9
22	15 2.2	15 5.7	55 5.4	+ 1.00	55 17.9	+ 1.07	12 10.2	2.23	14.9
23	15 9.2	15 13.0	55 31.0	1.12	55 44.7	1.16	13 4.2	2.27	15.9
24	15 16.8	15 20.8	55 58.8	1.20	56 13.3	1.23	13 58.4	2.24	16.9
25	15 24.8	15 29.0	56 28.2	+ 1.25	56 43.4	+ 1.27	14 51.5	2.17	17.9
26	15 33.1	15 37.4	56 58.8	1.29	57 14.4	1.31	15 42.6	2.09	18.9
27	15 41.7	15 46.0	57 30.1	1.32	57 46.0	1.33	16 31.9	2.02	19.9
28	15 50.3	15 54.7	58 1.9	+ 1.33	58 17.8	+ 1.31	17 19.7	1.98	20.9
29	15 58.9	16 3.1	58 33.4	1.29	58 48.6	1.25	18 7.2	1.99	21.9
30	16 7.1	16 10.8	59 3.3	1.19	59 17.2	1.12	18 55.5	2.05	22.9
31	16 14.3	16 17.4	59 29.9	1.01	59 41.1	0.87	19 46.0	2.17	23.9
32	16 20.0	16 22.0	59 50.6	+ 0.70	59 58.0	+ 0.52	20 39.9	2.32	24.9

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 1.					FRIDAY 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 21 22.32	2.1202	S. 9 35 22.7	14.573	0	1 3 36.74	2.1701	N. 2 54 56.8	16.169
1	23 23 29.51	2.1195	9 20 46.4	14.637	1	1 5 47.03	2.1731	3 11 6.9	16.167
2	23 25 36.66	2.1188	9 6 6.3	14.699	2	1 7 57.51	2.1763	3 27 16.8	16.163
3	23 27 43.77	2.1182	8 51 22.5	14.761	3	1 10 8.18	2.1794	3 43 26.5	16.158
4	23 29 50.84	2.1177	8 36 35.0	14.821	4	1 12 19.04	2.1827	3 59 35.8	16.152
5	23 31 57.89	2.1171	8 21 44.0	14.879	5	1 14 30.10	2.1861	4 15 44.7	16.143
6	23 34 4.91	2.1168	8 6 49.5	14.937	6	1 16 41.37	2.1895	4 31 53.0	16.133
7	23 36 11.91	2.1165	7 51 51.6	14.993	7	1 18 52.84	2.1929	4 48 0.6	16.120
8	23 38 18.89	2.1163	7 36 50.3	15.048	8	1 21 4.52	2.1965	5 4 7.4	16.107
9	23 40 25.86	2.1161	7 21 45.8	15.102	9	1 23 16.42	2.2003	5 20 13.4	16.092
10	23 42 32.82	2.1159	7 6 38.1	15.155	10	1 25 28.55	2.2040	5 36 18.4	16.074
11	23 44 39.77	2.1159	6 51 27.2	15.207	11	1 27 40.90	2.2078	5 52 22.3	16.055
12	23 46 46.73	2.1160	6 36 13.3	15.257	12	1 29 53.49	2.2118	6 8 25.0	16.034
13	23 48 53.69	2.1161	6 20 56.4	15.306	13	1 32 6.31	2.2158	6 24 26.4	16.012
14	23 51 0.66	2.1163	6 5 36.6	15.353	14	1 34 19.38	2.2198	6 40 26.4	15.988
15	23 53 7.65	2.1166	5 50 14.0	15.400	15	1 36 32.69	2.2239	6 56 24.9	15.962
16	23 55 14.65	2.1169	5 34 48.6	15.446	16	1 38 46.25	2.2282	7 12 21.8	15.934
17	23 57 21.67	2.1173	5 19 20.5	15.489	17	1 41 0.07	2.2325	7 28 17.0	15.904
18	23 59 28.72	2.1178	5 3 49.9	15.532	18	1 43 14.15	2.2369	7 44 10.3	15.873
19	0 1 35.81	2.1184	4 48 16.7	15.573	19	1 45 28.50	2.2413	8 0 1.7	15.840
20	0 3 42.93	2.1190	4 32 41.1	15.613	20	1 47 43.11	2.2458	8 15 51.1	15.805
21	0 5 50.09	2.1198	4 17 3.1	15.653	21	1 49 58.00	2.2505	8 31 38.3	15.768
22	0 7 57.30	2.1206	4 1 22.8	15.690	22	1 52 13.17	2.2552	8 47 23.2	15.728
23	0 10 4.56	2.1214	S. 3 45 40.3	15.727	23	1 54 28.62	2.2598	N. 9 3 5.7	15.688
THURSDAY 2.					SATURDAY 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 12 11.87	2.1224	S. 3 29 55.6	15.762	0	1 56 44.35	2.2647	N. 9 18 45.8	15.646
1	0 14 19.25	2.1235	3 14 8.9	15.795	1	1 59 0.38	2.2696	9 34 23.2	15.601
2	0 16 26.69	2.1246	2 58 20.2	15.827	2	2 1 16.70	2.2745	9 49 57.9	15.554
3	0 18 34.20	2.1258	2 42 29.7	15.858	3	2 3 33.32	2.2795	10 5 29.7	15.506
4	0 20 41.78	2.1270	2 26 37.3	15.888	4	2 5 50.24	2.2846	10 20 58.6	15.456
5	0 22 49.44	2.1284	2 10 43.2	15.915	5	2 8 7.47	2.2898	10 36 24.4	15.403
6	0 24 57.19	2.1299	1 54 47.5	15.942	6	2 10 25.01	2.2949	10 51 47.0	15.349
7	0 27 5.03	2.1314	1 38 50.2	15.968	7	2 12 42.86	2.3002	11 7 6.3	15.293
8	0 29 12.96	2.1330	1 22 51.4	15.992	8	2 15 1.03	2.3055	11 22 22.2	15.235
9	0 31 20.99	2.1348	1 6 51.2	16.013	9	2 17 19.52	2.3108	11 37 34.5	15.174
10	0 33 29.13	2.1365	0 50 49.8	16.033	10	2 19 38.33	2.3163	11 52 43.1	15.112
11	0 35 37.37	2.1383	0 34 47.2	16.053	11	2 21 57.48	2.3219	12 7 48.0	15.048
12	0 37 45.73	2.1403	0 18 43.4	16.072	12	2 24 16.96	2.3274	12 22 49.0	14.983
13	0 39 54.21	2.1423	S. 0 2 38.6	16.088	13	2 26 36.77	2.3330	12 37 45.9	14.915
14	0 42 2.81	2.1444	N. 0 13 27.2	16.103	14	2 28 56.92	2.3387	12 52 38.7	14.844
15	0 44 11.54	2.1466	0 29 33.8	16.117	15	2 31 17.41	2.3444	13 7 27.2	14.772
16	0 46 20.40	2.1488	0 45 41.2	16.128	16	2 33 38.25	2.3502	13 22 11.3	14.698
17	0 48 29.40	2.1513	1 1 49.2	16.138	17	2 35 59.43	2.3559	13 36 50.9	14.622
18	0 50 38.55	2.1538	1 17 57.8	16.148	18	2 38 20.96	2.3618	13 51 25.9	14.543
19	0 52 47.85	2.1563	1 34 7.0	16.156	19	2 40 42.85	2.3678	14 5 56.1	14.463
20	0 54 57.30	2.1588	1 50 16.5	16.161	20	2 43 5.09	2.3736	14 20 21.4	14.380
21	0 57 6.91	2.1615	2 6 26.3	16.166	21	2 45 27.68	2.3795	14 34 41.7	14.296
22	0 59 16.68	2.1643	2 22 36.4	16.169	22	2 47 50.63	2.3855	14 48 56.9	14.210
23	1 1 26.62	2.1672	2 38 46.6	16.170	23	2 50 13.94	2.3916	15 3 6.9	14.122
24	1 3 36.74	2.1701	N. 2 54 56.8	16.169	24	2 52 37.62	2.3977	N. 15 17 11.5	14.031

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 5.					TUESDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	2 52 37.62	2.3977	N.15 17 11.5	14.031	0	4 54 34.33	2.6651	N.24 8 30.8	7.406
1	2 55 1.66	2.4038	15 31 10.6	13.938	1	4 57 14.35	2.6688	24 15 49.8	7.228
2	2 57 26.07	2.4099	15 45 4.1	13.843	2	4 59 54.59	2.6723	24 22 58.1	7.048
3	2 59 50.85	2.4160	15 58 51.8	13.747	3	5 2 35.03	2.6757	24 29 55.6	6.868
4	3 2 15.99	2.4221	16 12 33.7	13.648	4	5 5 15.67	2.6789	24 36 42.3	6.687
5	3 4 41.50	2.4283	16 26 9.6	13.548	5	5 7 56.50	2.6820	24 43 18.0	6.503
6	3 7 7.38	2.4345	16 39 39.4	13.444	6	5 10 37.51	2.6850	24 49 42.7	6.320
7	3 9 33.64	2.4408	16 53 2.9	13.339	7	5 13 18.70	2.6878	24 55 56.4	6.136
8	3 12 0.27	2.4469	17 6 20.1	13.232	8	5 16 0.05	2.6904	25 1 59.0	5.951
9	3 14 27.27	2.4531	17 19 30.8	13.123	9	5 18 41.55	2.6929	25 7 50.5	5.765
10	3 16 54.64	2.4593	17 32 34.9	13.012	10	5 21 23.20	2.6953	25 13 30.8	5.578
11	3 19 22.39	2.4656	17 45 32.3	12.899	11	5 24 4.98	2.6971	25 18 59.8	5.390
12	3 21 50.51	2.4718	17 58 22.8	12.784	12	5 26 46.89	2.6994	25 24 17.6	5.202
13	3 24 19.00	2.4780	18 11 6.4	12.667	13	5 29 28.91	2.7013	25 29 24.0	5.013
14	3 26 47.87	2.4843	18 23 42.9	12.548	14	5 32 11.04	2.7029	25 34 19.1	4.823
15	3 29 17.11	2.4904	18 36 12.1	12.426	15	5 34 53.26	2.7044	25 39 2.8	4.633
16	3 31 46.72	2.4966	18 48 34.0	12.303	16	5 37 35.57	2.7058	25 43 35.0	4.442
17	3 34 16.70	2.5028	19 0 48.5	12.178	17	5 40 17.95	2.7069	25 47 55.8	4.251
18	3 36 47.05	2.5088	19 12 55.4	12.051	18	5 43 0.40	2.7079	25 52 5.1	4.058
19	3 39 17.76	2.5149	19 24 54.6	11.922	19	5 45 42.90	2.7087	25 56 2.8	3.867
20	3 41 48.84	2.5210	19 36 46.0	11.790	20	5 48 25.44	2.7093	25 59 49.1	3.675
21	3 44 20.28	2.5271	19 48 29.4	11.657	21	5 51 8.01	2.7098	26 3 23.8	3.482
22	3 46 52.09	2.5331	20 0 4.8	11.523	22	5 53 50.61	2.7100	26 6 46.9	3.288
23	3 49 24.25	2.5390	N.20 11 32.1	11.386	23	5 56 33.21	2.7100	N.26 9 58.4	3.096
MONDAY 6.					WEDNESDAY 8.				
0	3 51 56.77	2.5450	N.20 22 51.1	11.247	0	5 59 15.81	2.7099	N.26 12 58.4	2.903
1	3 54 29.65	2.5509	20 34 1.7	11.106	1	6 1 58.40	2.7097	26 15 46.7	2.709
2	3 57 2.88	2.5568	20 45 3.8	10.963	2	6 4 40.97	2.7093	26 18 23.5	2.517
3	3 59 36.46	2.5625	20 55 57.3	10.819	3	6 7 23.51	2.7086	26 20 48.7	2.323
4	4 2 10.38	2.5683	21 6 42.1	10.673	4	6 10 6.00	2.7077	26 23 2.3	2.130
5	4 4 44.65	2.5740	21 17 18.0	10.524	5	6 12 48.43	2.7067	26 25 4.3	1.937
6	4 7 19.26	2.5796	21 27 45.0	10.375	6	6 15 30.80	2.7055	26 26 54.7	1.743
7	4 9 54.20	2.5851	21 38 3.0	10.223	7	6 18 13.09	2.7041	26 28 33.5	1.551
8	4 12 29.47	2.5905	21 48 11.8	10.070	8	6 20 55.29	2.7025	26 30 0.8	1.358
9	4 15 5.06	2.5959	21 58 11.4	9.915	9	6 23 37.39	2.7008	26 31 16.5	1.166
10	4 17 40.98	2.6012	22 8 1.6	9.758	10	6 26 19.38	2.6988	26 32 20.7	0.974
11	4 20 17.21	2.6064	22 17 42.4	9.601	11	6 29 1.25	2.6967	26 33 13.4	0.783
12	4 22 53.75	2.6116	22 27 13.7	9.441	12	6 31 42.98	2.6943	26 33 54.6	0.591
13	4 25 30.60	2.6167	22 36 35.3	9.279	13	6 34 24.57	2.6918	26 34 24.3	0.401
14	4 28 7.75	2.6216	22 45 47.2	9.117	14	6 37 6.00	2.6892	26 34 42.7	0.211
15	4 30 45.19	2.6264	22 54 49.3	8.958	15	6 39 47.27	2.6863	26 34 49.6	+0.021
16	4 33 22.92	2.6312	23 3 41.4	8.795	16	6 42 28.36	2.6833	26 34 45.2	-0.168
17	4 36 0.93	2.6358	23 12 23.5	8.618	17	6 45 9.27	2.6802	26 34 29.5	0.356
18	4 38 39.22	2.6403	23 20 55.5	8.448	18	6 47 49.98	2.6768	26 34 2.5	0.543
19	4 41 17.77	2.6448	23 29 17.3	8.278	19	6 50 30.48	2.6733	26 33 24.3	0.730
20	4 43 56.59	2.6491	23 37 28.9	8.107	20	6 53 10.77	2.6696	26 32 34.9	0.916
21	4 46 35.66	2.6533	23 45 30.1	7.933	21	6 55 50.83	2.6658	26 31 34.4	1.101
22	4 49 14.98	2.6573	23 53 20.8	7.758	22	6 58 30.66	2.6618	26 30 22.8	1.286
23	4 51 54.54	2.6613	24 1 1.1	7.583	23	7 1 10.24	2.6575	26 29 0.1	1.469
24	4 54 34.33	2.6651	N.24 8 30.8	7.406	24	7 3 49.56	2.6531	N.26 27 26.5	1.651

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 9.					SATURDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	7 3 49.56	2.6531	N. 26 27 26.5	1.651	0	9 3 55.28	2.3219	N. 22 2 38.9	8.797
1	7 6 28.61	2.6486	26 25 42.0	1.833	1	9 6 14.35	2.3138	21 53 47.8	8.907
2	7 9 7.39	2.6440	26 23 46.6	2.013	2	9 8 32.94	2.3058	21 44 50.1	9.016
3	7 11 45.89	2.6392	26 21 40.4	2.193	3	9 10 51.05	2.2978	21 35 45.9	9.123
4	7 14 24.10	2.6343	26 19 23.5	2.371	4	9 13 8.68	2.2898	21 26 35.4	9.227
5	7 17 2.00	2.6292	26 16 55.9	2.548	5	9 15 25.83	2.2818	21 17 18.7	9.330
6	7 19 39.59	2.6239	26 14 17.7	2.724	6	9 17 42.50	2.2738	21 7 55.8	9.432
7	7 22 16.87	2.6186	26 11 29.0	2.899	7	9 19 58.69	2.2658	20 58 26.9	9.532
8	7 24 53.82	2.6130	26 8 29.8	3.073	8	9 22 14.40	2.2579	20 48 52.0	9.630
9	7 27 30.43	2.6073	26 5 20.3	3.244	9	9 24 29.64	2.2501	20 39 11.3	9.727
10	7 30 6.70	2.6016	26 2 0.5	3.416	10	9 26 44.41	2.2423	20 29 24.8	9.823
11	7 32 42.62	2.5958	25 58 30.4	3.586	11	9 28 58.71	2.2343	20 19 32.6	9.917
12	7 35 18.19	2.5898	25 54 50.2	3.754	12	9 31 12.53	2.2265	20 9 34.8	10.009
13	7 37 53.39	2.5835	25 50 59.9	3.922	13	9 33 25.89	2.2188	19 59 31.5	10.099
14	7 40 28.21	2.5773	25 46 59.6	4.088	14	9 35 38.78	2.2110	19 49 22.9	10.188
15	7 43 2.66	2.5709	25 42 49.4	4.252	15	9 37 51.21	2.2033	19 39 9.0	10.275
16	7 45 36.72	2.5644	25 38 29.4	4.414	16	9 40 3.18	2.1957	19 28 49.9	10.362
17	7 48 10.39	2.5579	25 33 59.7	4.576	17	9 42 14.69	2.1880	19 18 25.6	10.447
18	7 50 43.67	2.5513	25 29 20.3	4.736	18	9 44 25.74	2.1804	19 7 56.3	10.529
19	7 53 16.54	2.5444	25 24 31.4	4.894	19	9 46 36.34	2.1729	18 57 22.1	10.611
20	7 55 49.00	2.5375	25 19 33.0	5.052	20	9 48 46.49	2.1654	18 46 43.0	10.692
21	7 58 21.04	2.5306	25 14 25.2	5.208	21	9 50 56.19	2.1579	18 35 59.1	10.770
22	8 0 52.67	2.5236	25 9 8.1	5.362	22	9 53 5.44	2.1506	18 25 10.6	10.847
23	8 3 23.87	2.5164	N. 25 3 41.8	5.514	23	9 55 14.26	2.1432	N. 18 14 17.5	10.923
FRIDAY 10.					SUNDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 5 54.64	2.5092	N. 24 58 6.4	5.665	0	9 57 22.63	2.1359	N. 18 3 19.9	10.997
1	8 8 24.97	2.5019	24 52 22.0	5.814	1	9 59 30.57	2.1288	17 52 17.9	11.070
2	8 10 54.87	2.4946	24 46 28.7	5.962	2	10 1 38.08	2.1216	17 41 11.5	11.142
3	8 13 24.32	2.4871	24 40 26.6	6.108	3	10 3 45.16	2.1144	17 30 0.9	11.212
4	8 15 53.32	2.4796	24 34 15.8	6.253	4	10 5 51.81	2.1073	17 18 46.1	11.281
5	8 18 21.87	2.4721	24 27 56.3	6.396	5	10 7 58.04	2.1004	17 7 27.2	11.348
6	8 20 49.97	2.4645	24 21 28.3	6.537	6	10 10 3.86	2.0935	16 56 4.3	11.414
7	8 23 17.61	2.4568	24 14 51.9	6.677	7	10 12 9.26	2.0866	16 44 37.5	11.479
8	8 25 44.79	2.4492	24 8 7.1	6.815	8	10 14 14.25	2.0798	16 33 6.8	11.542
9	8 28 11.51	2.4414	24 1 14.1	6.952	9	10 16 18.83	2.0730	16 21 32.4	11.604
10	8 30 37.76	2.4336	23 54 12.9	7.087	10	10 18 23.01	2.0663	16 9 54.3	11.665
11	8 33 3.54	2.4258	23 47 3.7	7.219	11	10 20 26.79	2.0598	15 58 12.6	11.725
12	8 35 28.85	2.4179	23 39 46.6	7.350	12	10 22 30.18	2.0533	15 46 27.3	11.783
13	8 37 53.69	2.4100	23 32 21.7	7.480	13	10 24 33.18	2.0468	15 34 38.6	11.840
14	8 40 18.05	2.4020	23 24 49.0	7.608	14	10 26 35.79	2.0403	15 22 46.5	11.897
15	8 42 41.93	2.3940	23 17 8.7	7.734	15	10 28 38.01	2.0339	15 10 51.0	11.952
16	8 45 5.33	2.3861	23 9 20.9	7.859	16	10 30 39.86	2.0277	14 58 52.3	12.006
17	8 47 28.26	2.3782	23 1 25.6	7.982	17	10 32 41.33	2.0214	14 46 50.5	12.056
18	8 49 50.71	2.3702	22 53 23.0	8.103	18	10 34 42.43	2.0153	14 34 45.6	12.108
19	8 52 12.68	2.3621	22 45 13.2	8.223	19	10 36 43.17	2.0093	14 22 37.6	12.158
20	8 54 34.16	2.3540	22 36 56.2	8.342	20	10 38 43.55	2.0033	14 10 26.7	12.206
21	8 56 55.16	2.3460	22 28 32.2	8.458	21	10 40 43.57	1.9974	13 58 12.9	12.253
22	8 59 15.68	2.3380	22 20 1.2	8.573	22	10 42 43.24	1.9916	13 45 56.3	12.299
23	9 1 35.72	2.3300	22 11 23.4	8.686	23	10 44 42.56	1.9858	13 33 37.0	12.345
24	9 3 55.28	2.3219	N. 22 2 38.9	8.797	24	10 46 41.54	1.9802	N. 13 21 14.9	12.389

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 13.					WEDNESDAY 15.				
0	10 46 41.54	1.9802	N. 13 21 14.9	12.389	0	12 16 40.65	1.7998	N. 2 54 13.1	13.408
1	10 48 40.18	1.9745	13 8 50.3	12.432	1	12 18 28.58	1.7979	2 40 48.6	13.409
2	10 50 38.48	1.9690	12 56 23.1	12.474	2	12 20 16.40	1.7962	2 27 24.0	13.411
3	10 52 36.46	1.9636	12 43 53.4	12.515	3	12 22 4.12	1.7945	2 13 59.3	13.412
4	10 54 34.11	1.9582	12 31 21.3	12.555	4	12 23 51.74	1.7929	2 0 34.6	13.411
5	10 56 31.44	1.9528	12 18 46.8	12.593	5	12 25 39.27	1.7913	1 47 19.0	13.409
6	10 58 28.45	1.9476	12 6 10.1	12.631	6	12 27 26.70	1.7898	1 33 45.5	13.408
7	11 0 25.15	1.9425	11 53 31.1	12.668	7	12 29 14.05	1.7886	1 20 21.1	13.406
8	11 2 21.55	1.9374	11 40 49.9	12.704	8	12 31 1.33	1.7873	1 6 56.8	13.403
9	11 4 17.64	1.9324	11 28 6.6	12.738	9	12 32 48.53	1.7861	0 53 32.8	13.398
10	11 6 13.44	1.9275	11 15 21.3	12.772	10	12 34 35.66	1.7849	0 40 9.0	13.395
11	11 8 8.94	1.9227	11 2 34.0	12.805	11	12 36 22.72	1.7838	0 26 45.4	13.390
12	11 10 4.16	1.9179	10 49 44.7	12.837	12	12 38 9.72	1.7829	N. 0 13 22.2	13.383
13	11 11 59.09	1.9133	10 36 53.6	12.867	13	12 39 56.67	1.7820	S. 0 0 0.6	13.378
14	11 13 53.75	1.9087	10 24 0.7	12.897	14	12 41 43.56	1.7812	0 13 23.1	13.371
15	11 15 48.13	1.9042	10 11 6.0	12.926	15	12 43 30.41	1.7804	0 26 45.1	13.363
16	11 17 42.25	1.8998	9 58 9.6	12.954	16	12 45 17.21	1.7797	0 40 6.7	13.355
17	11 19 36.10	1.8953	9 45 11.5	12.981	17	12 47 3.97	1.7791	0 53 27.7	13.346
18	11 21 29.69	1.8911	9 32 11.9	13.007	18	12 48 50.70	1.7786	1 6 48.2	13.337
19	11 23 23.03	1.8869	9 19 10.7	13.033	19	12 50 37.40	1.7781	1 20 8.1	13.327
20	11 25 16.12	1.8828	9 6 8.0	13.057	20	12 52 24.07	1.7777	1 33 27.4	13.316
21	11 27 8.96	1.8787	8 53 3.9	13.080	21	12 54 10.72	1.7773	1 46 46.0	13.304
22	11 29 1.56	1.8748	8 39 58.4	13.102	22	12 55 57.35	1.7772	2 0 3.9	13.293
23	11 30 53.93	1.8708	N. 8 26 51.6	13.123	23	12 57 43.98	1.7770	S. 2 13 21.1	13.280
TUESDAY 14.					THURSDAY 16.				
0	11 32 46.06	1.8670	N. 8 13 43.6	13.144	0	12 59 30.59	1.7768	S. 2 26 37.5	13.266
1	11 34 37.97	1.8633	8 0 34.3	13.164	1	13 1 17.20	1.7768	2 39 53.0	13.252
2	11 36 29.66	1.8597	7 47 23.9	13.183	2	13 3 3.81	1.7769	2 53 7.7	13.238
3	11 38 21.13	1.8561	7 34 12.3	13.202	3	13 4 50.43	1.7771	3 6 21.5	13.223
4	11 40 12.39	1.8527	7 20 59.6	13.220	4	13 6 37.06	1.7773	3 19 34.4	13.207
5	11 42 3.45	1.8493	7 7 45.9	13.237	5	13 8 23.70	1.7774	3 32 46.3	13.190
6	11 43 54.30	1.8459	6 54 31.2	13.253	6	13 10 10.35	1.7776	3 45 57.2	13.173
7	11 45 44.96	1.8427	6 41 15.6	13.268	7	13 11 57.03	1.7782	3 59 7.0	13.154
8	11 47 35.42	1.8395	6 27 59.1	13.282	8	13 13 43.73	1.7787	4 12 15.7	13.136
9	11 49 25.70	1.8365	6 14 41.8	13.295	9	13 15 30.47	1.7793	4 25 23.3	13.117
10	11 51 15.80	1.8335	6 1 23.7	13.308	10	13 17 17.24	1.7798	4 38 29.7	13.098
11	11 53 5.72	1.8306	5 48 4.8	13.320	11	13 19 4.05	1.7805	4 51 35.0	13.078
12	11 54 55.47	1.8278	5 34 45.3	13.331	12	13 20 50.90	1.7813	5 4 39.0	13.056
13	11 56 45.05	1.8250	5 21 25.1	13.342	13	13 22 37.80	1.7822	5 17 41.7	13.034
14	11 58 34.47	1.8223	5 8 4.3	13.351	14	13 24 24.76	1.7831	5 30 43.1	13.012
15	12 0 23.72	1.8196	4 54 43.0	13.359	15	13 26 11.77	1.7840	5 43 43.1	12.988
16	12 2 12.82	1.8171	4 41 21.2	13.368	16	13 27 58.84	1.7850	5 56 41.7	12.964
17	12 4 1.77	1.8147	4 27 58.9	13.376	17	13 29 45.97	1.7861	6 9 38.8	12.940
18	12 5 50.58	1.8123	4 14 36.1	13.383	18	13 31 33.17	1.7873	6 22 34.5	12.916
19	12 7 39.25	1.8100	4 1 13.0	13.388	19	13 33 20.45	1.7886	6 35 28.7	12.890
20	12 9 27.78	1.8078	3 47 49.5	13.394	20	13 35 7.80	1.7898	6 48 21.3	12.863
21	12 11 16.18	1.8056	3 34 25.7	13.398	21	13 36 55.23	1.7912	7 1 12.3	12.837
22	12 13 4.45	1.8036	3 21 1.7	13.402	22	13 38 42.74	1.7926	7 14 1.7	12.809
23	12 14 52.61	1.8017	3 7 37.5	13.405	23	13 40 30.34	1.7942	7 26 49.4	12.780
24	12 16 40.65	1.7998	N. 2 54 13.1	13.408	24	13 42 18.04	1.7958	S. 7 39 35.3	12.751

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 17.					SUNDAY 19.				
0	13 42 18.04	1.7955	S. 7 39 35.3	12.751	0	15 11 29.12	1.9418	S. 17 4 44.6	10.503
1	13 44 5.84	1.7974	7 52 19.5	12.722	1	15 13 25.75	1.9460	17 15 12.8	10.436
2	13 45 53.73	1.7991	8 5 1.9	12.692	2	15 15 22.64	1.9503	17 25 36.9	10.368
3	13 47 41.73	1.8009	8 17 42.5	12.661	3	15 17 19.79	1.9548	17 35 57.0	10.301
4	13 49 29.84	1.8028	8 30 21.2	12.629	4	15 19 17.21	1.9592	17 46 13.0	10.232
5	13 51 18.06	1.8046	8 42 58.0	12.597	5	15 21 14.89	1.9636	17 56 24.8	10.161
6	13 53 6.39	1.8066	8 55 32.8	12.563	6	15 23 12.84	1.9680	18 6 32.3	10.090
7	13 54 54.85	1.8087	9 8 5.6	12.530	7	15 25 11.05	1.9725	18 16 35.6	10.018
8	13 56 43.43	1.8107	9 20 36.4	12.496	8	15 27 9.54	1.9771	18 26 34.5	9.945
9	13 58 32.13	1.8128	9 33 5.1	12.460	9	15 29 8.30	1.9817	18 36 29.0	9.872
10	14 0 20.97	1.8151	9 45 31.6	12.424	10	15 31 7.34	1.9863	18 46 19.1	9.797
11	14 2 9.94	1.8174	9 57 56.0	12.388	11	15 33 6.65	1.9908	18 56 4.6	9.721
12	14 3 59.05	1.8198	10 10 18.1	12.350	12	15 35 6.24	1.9955	19 5 45.6	9.645
13	14 5 48.31	1.8222	10 22 38.0	12.313	13	15 37 6.11	2.0002	19 15 22.0	9.567
14	14 7 37.71	1.8246	10 34 55.6	12.274	14	15 39 6.26	2.0049	19 24 53.7	9.488
15	14 9 27.26	1.8271	10 47 10.9	12.235	15	15 41 6.70	2.0097	19 34 20.6	9.409
16	14 11 16.96	1.8297	10 59 23.8	12.194	16	15 43 7.42	2.0144	19 43 42.8	9.330
17	14 13 6.82	1.8323	11 11 34.2	12.153	17	15 45 8.43	2.0192	19 53 0.2	9.249
18	14 14 56.84	1.8351	11 23 42.2	12.112	18	15 47 9.72	2.0239	20 2 12.7	9.167
19	14 16 47.03	1.8377	11 35 47.7	12.070	19	15 49 11.30	2.0288	20 11 20.2	9.083
20	14 18 37.39	1.8408	11 47 50.6	12.027	20	15 51 13.18	2.0337	20 20 22.7	8.999
21	14 20 27.92	1.8436	11 59 50.9	11.983	21	15 53 15.34	2.0384	20 29 20.1	8.914
22	14 22 18.62	1.8465	12 11 48.6	11.939	22	15 55 17.79	2.0433	20 38 12.4	8.828
23	14 24 9.50	1.8496	S. 12 23 43.6	11.893	23	15 57 20.54	2.0483	S. 20 46 59.5	8.742
SATURDAY 18.					MONDAY 20.				
0	14 26 0.57	1.8527	S. 12 35 35.8	11.848	0	15 59 23.58	2.0533	S. 20 55 41.4	8.654
1	14 27 51.82	1.8558	12 47 25.3	11.801	1	16 1 26.92	2.0581	21 4 18.0	8.565
2	14 29 43.26	1.8589	12 59 11.9	11.753	2	16 3 30.55	2.0629	21 12 49.2	8.475
3	14 31 34.89	1.8622	13 10 55.6	11.704	3	16 5 34.47	2.0678	21 21 15.0	8.385
4	14 33 26.72	1.8654	13 22 36.4	11.656	4	16 7 38.69	2.0728	21 29 35.4	8.293
5	14 35 18.74	1.8688	13 34 14.3	11.606	5	16 9 43.21	2.0778	21 37 50.2	8.201
6	14 37 10.97	1.8722	13 45 49.1	11.555	6	16 11 48.03	2.0828	21 45 59.5	8.108
7	14 39 3.40	1.8756	13 57 20.9	11.503	7	16 13 53.14	2.0877	21 54 3.1	8.013
8	14 40 56.04	1.8792	14 8 49.5	11.451	8	16 15 58.55	2.0927	22 2 1.0	7.918
9	14 42 48.90	1.8827	14 20 15.0	11.398	9	16 18 4.26	2.0976	22 9 53.2	7.822
10	14 44 41.97	1.8863	14 31 37.3	11.344	10	16 20 10.26	2.1025	22 17 39.6	7.724
11	14 46 35.25	1.8899	14 42 56.3	11.289	11	16 22 16.56	2.1074	22 25 20.1	7.625
12	14 48 28.76	1.8937	14 54 12.0	11.231	12	16 24 23.15	2.1123	22 32 54.6	7.526
13	14 50 22.49	1.8974	15 5 24.4	11.178	13	16 26 30.04	2.1173	22 40 23.2	7.426
14	14 52 16.45	1.9013	15 16 33.3	11.120	14	16 28 37.23	2.1223	22 47 45.7	7.324
15	14 54 10.64	1.9051	15 27 38.8	11.062	15	16 30 44.71	2.1272	22 55 2.1	7.223
16	14 56 5.06	1.9089	15 38 40.8	11.003	16	16 32 52.49	2.1321	23 2 12.4	7.120
17	14 57 59.71	1.9128	15 49 39.2	10.944	17	16 35 0.56	2.1369	23 9 16.5	7.016
18	14 59 54.60	1.9169	16 0 34.1	10.884	18	16 37 8.92	2.1418	23 16 14.3	6.910
19	15 1 49.74	1.9210	16 11 25.3	10.823	19	16 39 17.58	2.1467	23 23 5.7	6.804
20	15 3 45.12	1.9250	16 22 12.8	10.760	20	16 41 26.53	2.1515	23 29 50.8	6.698
21	15 5 40.74	1.9291	16 32 56.5	10.697	21	16 43 35.76	2.1563	23 36 29.4	6.590
22	15 7 36.61	1.9333	16 43 36.4	10.633	22	16 45 45.28	2.1611	23 43 1.6	6.482
23	15 9 32.74	1.9376	16 54 12.5	10.568	23	16 47 55.09	2.1659	23 49 27.2	6.372
24	15 11 29.12	1.9418	S. 17 4 44.6	10.503	24	16 50 5.19	2.1707	S. 23 55 46.2	6.261

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 21.					THURSDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	16 50 5.19	2.1707	S. 23 55 46.2	6.261	0	18 38 49.76	2.3345	S. 26 33 19.5	-0.045
1	16 52 15.57	2.1753	24 1 58.5	6.149	1	18 41 9.88	2.3360	26 33 17.9	+0.098
2	16 54 26.23	2.1800	24 8 4.1	6.037	2	18 43 30.08	2.3373	26 33 7.7	0.242
3	16 56 37.17	2.1847	24 14 2.9	5.923	3	18 45 50.36	2.3387	26 32 48.9	0.385
4	16 58 48.39	2.1893	24 19 54.9	5.809	4	18 48 10.72	2.3399	26 32 21.5	0.528
5	17 0 59.88	2.1938	24 25 40.0	5.694	5	18 50 31.15	2.3410	26 31 45.5	0.673
6	17 3 11.65	2.1984	24 31 18.2	5.578	6	18 52 51.64	2.3420	26 31 0.8	0.818
7	17 5 23.69	2.2029	24 36 49.4	5.462	7	18 55 12.19	2.3429	26 30 7.4	0.962
8	17 7 36.00	2.2074	24 42 13.6	5.344	8	18 57 32.79	2.3438	26 29 5.4	1.106
9	17 9 48.58	2.2118	24 47 30.7	5.225	9	18 59 53.44	2.3445	26 27 54.7	1.251
10	17 12 1.42	2.2162	24 52 40.6	5.105	10	19 2 14.13	2.3452	26 26 35.3	1.396
11	17 14 14.52	2.2205	24 57 43.3	4.985	11	19 4 34.86	2.3458	26 25 7.2	1.540
12	17 16 27.88	2.2248	25 2 38.8	4.864	12	19 6 55.62	2.3462	26 23 30.5	1.684
13	17 18 41.50	2.2291	25 7 27.0	4.742	13	19 9 16.40	2.3465	26 21 45.1	1.829
14	17 20 55.37	2.2333	25 12 7.8	4.618	14	19 11 37.20	2.3468	26 19 51.0	1.974
15	17 23 9.49	2.2374	25 16 41.2	4.495	15	19 13 58.01	2.3469	26 17 48.2	2.119
16	17 25 23.86	2.2416	25 21 7.2	4.371	16	19 16 18.83	2.3470	26 15 36.7	2.264
17	17 27 38.48	2.2456	25 25 25.7	4.246	17	19 18 39.65	2.3470	26 13 16.5	2.409
18	17 29 53.33	2.2495	25 29 36.7	4.120	18	19 21 0.47	2.3469	26 10 47.6	2.553
19	17 32 8.42	2.2534	25 33 40.1	3.993	19	19 23 21.28	2.3468	26 8 10.1	2.698
20	17 34 23.74	2.2573	25 37 35.8	3.865	20	19 25 42.08	2.3464	26 5 23.9	2.843
21	17 36 39.29	2.2610	25 41 23.9	3.737	21	19 28 2.85	2.3459	26 2 29.0	2.988
22	17 38 55.06	2.2647	25 45 4.3	3.608	22	19 30 23.59	2.3454	25 59 25.4	3.132
23	17 41 11.05	2.2684	S. 25 48 36.9	3.478	23	19 32 44.30	2.3449	S. 25 56 13.2	3.275
WEDNESDAY 22.					FRIDAY 24.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	17 43 27.27	2.2721	S. 25 52 1.7	3.348	0	19 35 4.98	2.3443	S. 25 52 52.4	3.419
1	17 45 43.70	2.2755	25 55 18.6	3.217	1	19 37 25.61	2.3435	25 49 22.9	3.563
2	17 48 0.33	2.2789	25 58 27.7	3.085	2	19 39 46.20	2.3427	25 45 44.9	3.706
3	17 50 17.17	2.2823	26 1 28.8	2.953	3	19 42 6.73	2.3417	25 41 58.2	3.849
4	17 52 34.21	2.2857	26 4 22.0	2.820	4	19 44 27.20	2.3407	25 38 3.0	3.992
5	17 54 51.45	2.2889	26 7 7.2	2.686	5	19 46 47.61	2.3396	25 33 59.2	4.135
6	17 57 8.88	2.2920	26 9 44.3	2.552	6	19 49 7.95	2.3384	25 29 46.8	4.277
7	17 59 26.49	2.2950	26 12 13.4	2.417	7	19 51 28.22	2.3372	25 25 25.9	4.418
8	18 1 44.28	2.2981	26 14 34.3	2.281	8	19 53 48.41	2.3358	25 20 56.6	4.560
9	18 4 2.26	2.3011	26 16 47.1	2.145	9	19 56 8.52	2.3344	25 16 18.7	4.702
10	18 6 20.41	2.3039	26 18 51.7	2.008	10	19 58 28.54	2.3329	25 11 32.4	4.843
11	18 8 38.73	2.3067	26 20 48.0	1.870	11	20 0 48.47	2.3313	25 6 37.6	4.983
12	18 10 57.21	2.3093	26 22 36.1	1.733	12	20 3 8.30	2.3297	25 1 34.4	5.123
13	18 13 15.85	2.3119	26 24 15.9	1.594	13	20 5 28.03	2.3279	24 56 22.8	5.263
14	18 15 34.64	2.3144	26 25 47.4	1.456	14	20 7 47.65	2.3261	24 51 2.9	5.402
15	18 17 53.58	2.3168	26 27 10.6	1.317	15	20 10 7.16	2.3243	24 45 34.6	5.541
16	18 20 12.66	2.3191	26 28 25.4	1.177	16	20 12 26.56	2.3223	24 39 58.0	5.678
17	18 22 31.87	2.3213	26 29 31.8	1.037	17	20 14 45.84	2.3203	24 34 13.2	5.816
18	18 24 51.22	2.3235	26 30 29.8	0.896	18	20 17 5.00	2.3183	24 28 20.1	5.953
19	18 27 10.69	2.3256	26 31 19.3	0.754	19	20 19 24.03	2.3161	24 22 18.8	6.090
20	18 29 30.29	2.3276	26 32 0.3	0.613	20	20 21 42.93	2.3139	24 16 9.3	6.226
21	18 31 50.00	2.3294	26 32 32.9	0.472	21	20 24 1.70	2.3117	24 9 51.7	6.361
22	18 34 9.82	2.3312	26 32 57.0	0.330	22	20 26 20.33	2.3093	24 3 26.0	6.496
23	18 36 29.74	2.3328	26 33 12.5	0.188	23	20 28 38.82	2.3069	23 56 52.2	6.630
24	18 38 49.76	2.3345	S. 26 33 19.5	-0.045	24	20 30 57.16	2.3044	S. 23 50 10.4	6.763

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 25.					MONDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	20 30 57.16	2.3044	S. 23 50 10.4	6.763	0	22 18 8.53	2.1582	S. 16 6 40.9	12.198
1	20 33 15.35	2.3019	23 43 20.6	6.897	1	22 20 17.93	2.1553	15 54 26.3	12.288
2	20 35 33.39	2.2994	23 36 22.8	7.029	2	22 22 27.16	2.1524	15 42 6.4	12.376
3	20 37 51.28	2.2968	23 29 17.1	7.160	3	22 24 36.22	2.1496	15 29 41.2	12.463
4	20 40 9.01	2.2942	23 22 3.6	7.291	4	22 26 45.11	2.1468	15 17 10.8	12.549
5	20 42 26.58	2.2915	23 14 42.2	7.421	5	22 28 53.83	2.1440	15 4 35.3	12.634
6	20 44 43.99	2.2888	23 7 13.1	7.550	6	22 31 2.39	2.1413	14 51 54.7	12.718
7	20 47 1.23	2.2859	22 59 36.2	7.679	7	22 33 10.78	2.1385	14 39 9.1	12.802
8	20 49 18.30	2.2832	22 51 51.6	7.808	8	22 35 19.01	2.1359	14 26 18.5	12.883
9	20 51 35.21	2.2803	22 43 59.3	7.935	9	22 37 27.09	2.1333	14 13 23.1	12.963
10	20 53 51.94	2.2774	22 35 59.4	8.061	10	22 39 35.01	2.1307	14 0 22.9	13.043
11	20 56 8.50	2.2745	22 27 52.0	8.187	11	22 41 42.77	2.1282	13 47 17.9	13.123
12	20 58 24.88	2.2715	22 19 37.0	8.312	12	22 43 50.39	2.1258	13 34 8.2	13.200
13	21 0 41.08	2.2685	22 11 14.6	8.436	13	22 45 57.86	2.1233	13 20 53.9	13.275
14	21 2 57.10	2.2655	22 2 44.7	8.559	14	22 48 5.19	2.1209	13 7 35.2	13.350
15	21 5 12.94	2.2624	21 54 7.5	8.682	15	22 50 12.37	2.1186	12 54 11.9	13.425
16	21 7 28.59	2.2593	21 45 22.9	8.803	16	22 52 19.42	2.1164	12 40 44.2	13.498
17	21 9 44.06	2.2563	21 36 31.1	8.923	17	22 54 26.34	2.1142	12 27 12.2	13.569
18	21 11 59.34	2.2531	21 27 32.1	9.043	18	22 56 33.12	2.1119	12 13 35.9	13.640
19	21 14 14.43	2.2499	21 18 25.9	9.163	19	22 58 39.77	2.1098	11 59 55.4	13.710
20	21 16 29.33	2.2468	21 9 12.6	9.281	20	23 0 46.30	2.1078	11 46 10.7	13.778
21	21 18 44.04	2.2436	20 59 52.2	9.398	21	23 2 52.70	2.1058	11 32 22.0	13.845
22	21 20 58.56	2.2404	20 50 24.8	9.515	22	23 4 58.99	2.1038	11 18 29.3	13.912
23	21 23 12.89	2.2373	S. 20 40 50.4	9.630	23	23 7 5.16	2.1019	S. 11 4 32.6	13.977
SUNDAY 26.					TUESDAY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 25 27.03	2.2340	S. 20 31 9.2	9.744	0	23 9 11.22	2.1001	S. 10 50 32.1	14.040
1	21 27 40.97	2.2308	20 21 21.1	9.858	1	23 11 17.17	2.0983	10 36 27.8	14.103
2	21 29 54.72	2.2275	20 11 26.3	9.970	2	23 13 23.02	2.0967	10 22 19.7	14.165
3	21 32 8.27	2.2243	20 1 24.7	10.083	3	23 15 28.77	2.0950	10 8 8.0	14.225
4	21 34 21.63	2.2211	19 51 16.4	10.193	4	23 17 34.42	2.0934	9 53 52.7	14.284
5	21 36 34.80	2.2178	19 41 1.5	10.303	5	23 19 39.98	2.0919	9 39 33.9	14.343
6	21 38 47.77	2.2145	19 30 40.0	10.412	6	23 21 45.45	2.0904	9 25 11.6	14.400
7	21 41 0.54	2.2113	19 20 12.1	10.519	7	23 23 50.83	2.0890	9 10 45.9	14.456
8	21 43 13.12	2.2081	19 9 37.7	10.626	8	23 25 56.13	2.0878	8 56 16.9	14.511
9	21 45 25.51	2.2048	18 58 57.0	10.732	9	23 28 1.36	2.0865	8 41 44.6	14.565
10	21 47 37.70	2.2016	18 48 9.9	10.838	10	23 30 6.51	2.0853	8 27 9.1	14.617
11	21 49 49.70	2.1984	18 37 16.5	10.941	11	23 32 11.59	2.0842	8 12 30.5	14.668
12	21 52 1.51	2.1952	18 26 17.0	11.043	12	23 34 16.61	2.0832	7 57 48.9	14.718
13	21 54 13.12	2.1920	18 15 11.3	11.146	13	23 36 21.57	2.0822	7 43 4.3	14.768
14	21 56 24.55	2.1888	18 3 59.5	11.247	14	23 38 26.47	2.0813	7 28 16.8	14.815
15	21 58 35.78	2.1856	17 52 41.7	11.346	15	23 40 31.32	2.0804	7 13 26.5	14.862
16	22 0 46.82	2.1825	17 41 18.0	11.444	16	23 42 36.12	2.0796	6 58 33.4	14.907
17	22 2 57.68	2.1794	17 29 48.4	11.543	17	23 44 40.87	2.0789	6 43 37.7	14.951
18	22 5 8.35	2.1763	17 18 12.9	11.639	18	23 46 45.59	2.0783	6 28 39.3	14.995
19	22 7 18.84	2.1733	17 6 31.7	11.735	19	23 48 50.27	2.0778	6 13 38.3	15.037
20	22 9 29.14	2.1702	16 54 44.7	11.830	20	23 50 54.92	2.0773	5 58 34.9	15.077
21	22 11 39.26	2.1671	16 42 52.1	11.923	21	23 52 59.55	2.0770	5 43 29.1	15.117
22	22 13 49.19	2.1641	16 30 53.9	12.017	22	23 55 4.16	2.0767	5 28 20.9	15.155
23	22 15 58.95	2.1612	16 18 50.1	12.108	23	23 57 8.75	2.0764	5 13 10.5	15.192
24	22 18 8.53	2.1582	S. 16 6 40.9	12.198	24	23 59 13.33	2.0763	S. 4 57 57.9	15.228



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 29.					FRIDAY JULY 1.				
	<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>
0	23 59 13.33	2.0763	S. 4 57 57.9	15.228	0	1 40 14.78	2.1653	N. 7 29 51.4	15.408
1	0 1 17.90	2.0762	4 42 43.2	15.263	PHASES OF THE MOON.				
2	0 3 22.47	2.0762	4 27 26.4	15.296					
3	0 5 27.04	2.0763	4 12 7.7	15.328					
4	0 7 31.62	2.0763	3 56 47.1	15.358					
5	0 9 36.20	2.0765	3 41 24.7	15.388					
6	0 11 40.80	2.0769	3 26 0.5	15.417					
7	0 13 45.43	2.0773	3 10 34.6	15.444					
8	0 15 50.08	2.0778	2 55 7.2	15.470					
9	0 17 54.76	2.0783	2 39 38.2	15.495					
10	0 19 59.48	2.0790	2 24 7.8	15.518					
11	0 22 4.24	2.0797	2 8 36.0	15.540	<div>● New Moon . . . . . June 7 1 16.4</div> <div>☾ First Quarter . . . . . 14 4 19.4</div> <div>○ Full Moon . . . . . 22 8 11.9</div> <div>☾ Last Quarter . . . . . 29 16 38.9</div>				
12	0 24 9.04	2.0804	1 53 3.0	15.560					
13	0 26 13.89	2.0813	1 37 28.8	15.580					
14	0 28 18.80	2.0823	1 21 53.4	15.599					
15	0 30 23.77	2.0834	1 6 16.9	15.616					
16	0 32 28.81	2.0845	0 50 39.5	15.631					
17	0 34 33.91	2.0857	0 35 1.2	15.646					
18	0 36 39.09	2.0870	0 19 22.0	15.659					
19	0 38 44.35	2.0884	S. 0 3 42.1	15.671					
20	0 40 49.70	2.0899	N. 0 11 58.5	15.682					
21	0 42 55.14	2.0914	0 27 39.7	15.691	<div>d h</div> <div>☾ Perigee . . . . . June 5 15.6</div> <div>☾ Apogee . . . . . 17 19.1</div>				
22	0 45 0.67	2.0931	0 43 21.4	15.698					
23	0 47 6.31	2.0948	N. 0 59 3.5	15.705					
THURSDAY 30.									
0	0 49 12.05	2.0966	N. 1 14 46.0	15.710					
1	0 51 17.90	2.0985	1 30 28.7	15.714					
2	0 53 23.87	2.1005	1 46 11.7	15.717					
3	0 55 29.96	2.1025	2 1 54.7	15.717					
4	0 57 36.17	2.1047	2 17 37.7	15.717					
5	0 59 42.52	2.1069	2 33 20.7	15.715					
6	1 1 49.00	2.1092	2 49 3.5	15.712					
7	1 3 55.62	2.1116	3 4 46.1	15.708					
8	1 6 2.39	2.1141	3 20 28.4	15.702					
9	1 8 9.31	2.1167	3 36 10.3	15.694					
10	1 10 16.39	2.1193	3 51 51.7	15.686					
11	1 12 23.63	2.1221	4 7 32.6	15.676					
12	1 14 31.04	2.1249	4 23 12.8	15.663					
13	1 16 38.62	2.1278	4 38 52.2	15.650					
14	1 18 46.37	2.1308	4 54 30.8	15.636					
15	1 20 54.31	2.1339	5 10 8.5	15.620					
16	1 23 2.44	2.1371	5 25 45.2	15.603					
17	1 25 10.76	2.1403	5 41 20.8	15.583					
18	1 27 19.27	2.1436	5 56 55.1	15.562					
19	1 29 27.99	2.1470	6 12 28.2	15.540					
20	1 31 36.91	2.1505	6 27 59.9	15.517					
21	1 33 46.05	2.1541	6 43 30.2	15.492					
22	1 35 55.40	2.1578	6 58 58.9	15.465					
23	1 38 4.98	2.1615	7 14 26.0	15.438					
24	1 40 14.78	2.1653	N. 7 29 51.4	15.408					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
1	Antares W.	98 22 54	2395	100 6 36	2381	101 50 38	2367	103 35 0	2354
	$\alpha$ Aquilæ W.	56 31 23	2652	57 49 1	2590	59 7 46	2552	60 27 34	2478
	$\alpha$ Arietis E.	51 5 22	2548	49 25 16	2543	47 45 2	2538	46 4 42	2535
	SUN E.	82 45 54	2698	81 9 11	2682	79 32 7	2667	77 54 43	2652
2	$\alpha$ Aquilæ W.	67 20 38	2354	68 45 43	2317	70 11 32	2312	71 38 2	2350
	SUN E.	69 42 44	2579	68 3 20	2565	66 23 37	2551	64 43 34	2538
3	$\alpha$ Aquilæ W.	78 59 27	3020	80 29 15	3000	81 59 28	2981	83 30 5	2965
	Fomalhaut W.	45 27 51	2510	47 8 50	2480	48 50 31	2452	50 32 52	2426
	SUN E.	56 18 43	2472	54 36 51	2460	52 54 42	2448	51 12 16	2437
4	$\alpha$ Aquilæ W.	91 7 35	2909	92 39 43	2904	94 11 58	2900	95 44 17	2899
	Fomalhaut W.	59 12 58	2324	60 58 23	2308	62 44 11	2293	64 30 21	2280
	SUN E.	42 36 24	2389	40 52 33	2381	39 8 31	2373	37 24 18	2366
5	$\alpha$ Aquilæ W.	103 25 27	2924	104 57 16	2936	106 28 50	2951	108 0 4	2968
	Fomalhaut W.	73 25 29	2231	75 13 10	2225	77 1 1	2219	78 49 0	2215
	SUN E.	28 40 58	2342	26 56 0	2339	25 10 58	2337	23 25 53	2337
9	SUN W.	26 46 37	2576	28 26 5	2591	30 5 12	2608	31 43 56	2626
	JUPITER E.	80 21 6	2279	78 34 36	2295	76 48 29	2312	75 2 47	2328
	Spica E.	98 25 27	2284	96 39 4	2300	94 53 4	2316	93 7 28	2332
10	SUN W.	39 51 36	2716	41 27 54	2735	43 3 48	2754	44 39 16	2773
	JUPITER E.	66 20 25	2416	64 37 13	2434	62 54 26	2453	61 12 6	2471
	Spica E.	84 25 32	2419	82 42 24	2437	80 59 41	2455	79 17 24	2473
11	SUN W.	52 30 19	2870	54 3 16	2889	55 35 49	2909	57 7 57	2923
	Pollux W.	19 59 20	2576	21 38 48	2590	23 17 57	2605	24 56 45	2620
	MARS W.	17 8 54	2818	18 42 58	2829	20 16 48	2841	21 50 24	2853
	JUPITER E.	52 46 52	2564	51 7 7	2582	49 27 47	2601	47 48 53	2619
	Spica E.	70 52 22	2565	69 12 39	2583	67 33 21	2602	65 54 29	2620
	Antares E.	116 45 39	2556	115 5 44	2574	113 26 13	2591	111 47 6	2609
12	SUN W.	64 42 36	3022	66 12 22	3040	67 41 45	3058	69 10 46	3075
	Pollux W.	33 5 31	2699	34 42 12	2715	36 18 32	2731	37 54 31	2746
	MARS W.	29 34 2	2926	31 5 48	2942	32 37 15	2958	34 8 21	2973
	JUPITER E.	39 40 37	2711	38 4 12	2729	36 28 10	2747	34 52 32	2764
	Spica E.	57 46 17	2711	56 9 52	2729	54 33 50	2746	52 58 12	2763
	Antares E.	103 37 28	2695	102 0 42	2712	100 24 18	2729	98 48 16	2745
13	SUN W.	76 30 36	3159	77 57 34	3175	79 24 13	3190	80 50 34	3205
	Pollux W.	45 49 24	2821	47 23 25	2835	48 57 7	2849	50 30 31	2862
	MARS W.	41 39 4	3048	43 8 17	3063	44 37 12	3077	46 5 49	3091
	JUPITER E.	27 0 10	2853	25 26 51	2872	23 53 56	2889	22 21 23	2908
	Spica E.	45 5 39	2849	43 32 15	2866	41 59 12	2882	40 26 30	2898
	Antares E.	90 53 22	2822	89 19 23	2837	87 45 43	2851	86 12 21	2865
14	SUN W.	87 58 2	3274	89 22 44	3286	90 47 11	3298	92 11 25	3310
	Pollux W.	58 13 22	2924	59 45 10	2935	61 16 43	2946	62 48 3	2957
	MARS W.	53 24 48	3156	54 51 50	3167	56 18 38	3178	57 45 12	3189

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Antares	W.	105 19 41	2340	107 4 42	2326	108 50 2	2313	110 35 44	2300
	α Aquilæ	W.	61 48 23	2347	63 10 9	2380	64 32 48	2335	65 56 19	2394
	α Arietis	E.	44 24 18	2534	42 43 52	2534	41 3 26	2556	39 23 3	2540
	SUN	E.	76 16 59	2638	74 38 55	2623	73 0 31	2608	71 21 47	2593
2	α Aquilæ	W.	73 5 11	3120	74 32 56	3092	76 1 15	3066	77 30 6	3042
	SUN	E.	63 3 13	2524	61 22 33	2510	59 41 34	2497	58 0 17	2485
3	α Aquilæ	W.	85 1 2	2950	86 32 18	2937	88 3 50	2926	89 35 37	2916
	Fomalhaut	W.	52 15 50	2402	53 59 22	2380	55 43 25	2359	57 27 58	2341
	SUN	E.	49 29 35	2426	47 46 38	2416	46 3 27	2407	44 20 2	2398
4	α Aquilæ	W.	97 16 38	2899	98 48 58	2901	100 21 15	2906	101 53 26	2914
	Fomalhaut	W.	66 16 50	2268	68 3 37	2257	69 50 40	2247	71 37 58	2238
	SUN	E.	35 39 54	2360	33 55 21	2354	32 10 40	2349	30 25 52	2345
5	α Aquilæ	W.	109 30 57	2989	111 1 24	3013	112 31 21	3040	114 0 45	3071
	Fomalhaut	W.	80 37 5	2212	82 25 15	2210	84 13 28	2209	86 1 43	2208
	SUN	E.	21 40 47	2337	19 55 41	2339	18 10 39	2343	16 25 42	2348
9	SUN	W.	33 22 16	2643	35 0 12	2661	36 37 45	2679	38 14 53	2698
	JUPITER	E.	73 17 29	2345	71 32 35	2363	69 48 7	2380	68 4 3	2398
	Spica	E.	91 22 16	2349	89 37 28	2366	87 53 5	2383	86 9 6	2401
10	SUN	W.	46 14 19	2792	47 48 57	2812	49 23 9	2831	50 56 57	2851
	JUPITER	E.	59 30 12	2489	57 48 44	2507	56 7 41	2526	54 27 4	2545
	Spica	E.	77 35 32	2491	75 54 6	2509	74 13 6	2527	72 32 31	2546
11	SUN	W.	58 39 40	2947	60 10 59	2966	61 41 55	2985	63 12 27	3003
	Pollux	W.	26 35 12	2635	28 13 19	2651	29 51 4	2667	31 28 28	2683
	MARS	W.	23 23 43	2866	24 56 45	2880	26 29 30	2894	28 1 56	2910
	JUPITER	E.	46 10 24	2638	44 32 20	2656	42 54 41	2674	41 17 27	2692
	Spica	E.	64 16 1	2638	62 37 58	2657	61 0 20	2675	59 23 6	2693
	Antares	E.	110 8 23	2626	108 30 4	2644	106 52 9	2661	105 14 37	2678
12	SUN	W.	70 39 26	3093	72 7 44	3110	73 35 42	3127	75 3 19	3143
	Pollux	W.	39 30 10	2762	41 5 28	2777	42 40 26	2792	44 15 4	2806
	MARS	W.	35 39 8	2989	37 9 35	3004	38 39 43	3019	40 9 32	3033
	JUPITER	E.	33 17 17	2782	31 42 25	2800	30 7 57	2818	28 33 52	2835
	Spica	E.	51 22 56	2781	49 48 3	2798	48 13 33	2815	46 39 25	2832
	Antares	E.	97 12 36	2761	95 37 17	2777	94 2 19	2792	92 27 41	2807
13	SUN	W.	82 16 37	3220	83 42 23	3234	85 7 52	3247	86 33 5	3261
	Pollux	W.	52 3 38	2876	53 36 28	2889	55 9 1	2901	56 41 19	2912
	MARS	W.	47 34 9	3105	49 2 12	3118	50 30 0	3131	51 57 32	3144
	JUPITER	E.	20 49 14	2928	19 17 30	2949	17 46 13	2972	16 15 25	2995
	Spica	E.	38 54 9	2914	37 22 8	2931	35 50 29	2947	34 19 10	2964
	Antares	E.	84 39 17	2878	83 6 30	2891	81 34 0	2904	80 1 46	2916
14	SUN	W.	93 35 25	3321	94 59 12	3331	96 22 48	3341	97 46 12	3351
	Pollux	W.	64 19 9	2967	65 50 3	2977	67 20 45	2986	68 51 15	2994
	MARS	W.	59 11 34	3199	60 37 43	3209	62 3 41	3219	63 29 27	3228

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
14	Regulus	W.	22 19 15	3019	23 49 4	3020	25 18 52	3022	26 48 37	3025
	Spica	E.	32 48 12	2981	31 17 35	2998	29 47 20	3016	28 17 26	3034
	Antares	E.	78 29 48	2928	76 58 5	2940	75 26 37	2951	73 55 22	2962
	$\alpha$ Aquilæ	E.	121 9 18	4104	119 59 20	4078	118 48 57	4056	117 38 13	4036
15	SUN	W.	99 9 24	3360	100 32 26	3369	101 55 18	3377	103 18 1	3385
	Pollux	W.	70 21 35	3002	71 51 44	3010	73 21 44	3018	74 51 35	3025
	MARS	W.	64 55 2	3237	66 20 27	3245	67 45 42	3253	69 10 48	3260
	Regulus	W.	34 16 23	3045	35 45 40	3049	37 14 52	3054	38 43 58	3059
	Antares	E.	66 22 21	3009	64 52 19	3017	63 22 27	3024	61 52 44	3032
	$\alpha$ Aquilæ	E.	111 40 7	3960	110 27 48	3949	109 15 18	3939	108 2 38	3930
16	SUN	W.	110 9 34	3416	111 31 32	3421	112 53 25	3425	114 15 13	3429
	Pollux	W.	82 18 50	3053	83 47 57	3057	85 16 59	3061	86 45 56	3064
	MARS	W.	76 14 23	3289	77 38 47	3294	79 3 5	3298	80 27 18	3302
	Regulus	W.	46 8 10	3078	47 36 47	3081	49 5 20	3083	50 33 50	3085
	Antares	E.	54 26 18	3062	52 57 22	3067	51 28 32	3071	49 59 47	3075
	$\alpha$ Aquilæ	E.	101 57 24	3900	100 44 4	3896	99 30 40	3892	98 17 12	3889
17	SUN	W.	121 3 18	3442	122 24 47	3443	123 46 15	3444	125 7 42	3445
	Pollux	W.	94 9 50	3075	95 38 30	3076	97 7 8	3077	98 35 46	3078
	MARS	W.	87 27 32	3313	88 51 28	3314	90 15 22	3315	91 39 16	3316
	Regulus	W.	57 55 47	3092	59 24 6	3093	60 52 24	3093	62 20 43	3092
	JUPITER	W.	21 32 36	3124	23 0 16	3122	24 27 58	3120	25 55 43	3117
	Antares	E.	42 37 10	3091	41 8 49	3093	39 40 31	3095	38 12 15	3096
	$\alpha$ Aquilæ	E.	92 9 19	3882	90 55 41	3883	89 42 4	3884	88 28 28	3885
18	Pollux	W.	105 59 0	3073	107 27 43	3071	108 56 29	3068	110 25 18	3066
	MARS	W.	98 38 50	3311	100 2 49	3309	101 26 51	3306	102 50 55	3303
	Regulus	W.	69 42 32	3085	71 10 59	3083	72 39 29	3080	74 8 3	3077
	JUPITER	W.	33 15 20	3104	34 43 25	3101	36 11 34	3097	37 39 47	3093
	Spica	W.	16 9 26	3279	17 34 2	3247	18 59 15	3220	20 25 0	3197
	Antares	E.	30 51 19	3103	29 25 13	3104	27 55 8	3105	26 27 5	3107
	$\alpha$ Aquilæ	E.	82 20 57	3900	81 7 37	3905	79 54 21	3910	78 41 11	3916
	Fomalhaut	E.	113 15 48	3270	111 51 1	3262	110 26 5	3256	109 1 2	3250
19	MARS	W.	109 52 9	3286	111 16 37	3281	112 41 11	3276	114 5 50	3271
	Regulus	W.	81 31 51	3059	83 0 51	3055	84 29 56	3050	85 59 7	3044
	JUPITER	W.	45 2 3	3073	46 30 46	3068	47 59 35	3063	49 28 30	3058
	Spica	W.	27 39 30	3121	29 7 15	3110	30 35 13	3099	32 3 25	3088
	$\alpha$ Aquilæ	E.	72 37 10	3959	71 24 50	3970	70 12 41	3984	69 0 46	3999
	Fomalhaut	E.	101 54 1	3220	100 28 16	3214	99 2 23	3208	97 36 23	3202
20	Regulus	W.	93 26 41	3016	94 56 33	3010	96 26 33	3004	97 56 40	2997
	JUPITER	W.	56 54 45	3029	58 24 22	3022	59 54 7	3016	61 24 0	3009
	Spica	W.	39 27 19	3043	40 56 39	3034	42 26 9	3026	43 55 50	3018
	$\alpha$ Aquilæ	E.	63 5 13	4095	61 55 6	4120	60 45 23	4147	59 36 7	4178
	Fomalhaut	E.	90 24 36	3172	88 57 53	3165	87 31 2	3159	86 4 4	3153
21	Regulus	W.	105 29 22	2963	107 0 21	2956	108 31 28	2949	110 2 45	2942
	JUPITER	W.	68 55 33	2974	70 26 18	2966	71 57 13	2958	73 28 18	2951
	Spica	W.	51 26 54	2974	52 57 39	2966	54 28 34	2958	55 59 40	2950

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
14	Regulus	W.	28 18 19	3028	29 47 57	3031	31 17 31	3035	32 47 0	3040
	Spica	E.	26 47 55	3053	25 18 47	3073	23 50 5	3095	22 21 49	3119
	Antares	E.	72 24 21	2972	70 53 33	2981	69 22 57	2991	67 52 33	3000
	α Aquilæ	E.	116 27 9	4018	115 15 47	4001	114 4 8	3985	112 52 14	3972
15	SUN	W.	104 40 35	3392	106 3 1	3399	107 25 19	3405	108 47 30	3411
	Pollux	W.	76 21 17	3031	77 50 51	3037	79 20 17	3043	80 49 37	3046
	MARS	W.	70 35 46	3267	72 0 36	3273	73 25 18	3279	74 49 54	3284
	Regulus	W.	40 12 58	3063	41 41 53	3067	43 10 43	3070	44 39 29	3074
	Antares	E.	60 23 11	3039	58 53 47	3045	57 24 30	3051	55 55 20	3057
	α Aquilæ	E.	106 49 49	3923	105 36 53	3916	104 23 49	3910	103 10 39	3905
16	SUN	W.	115 36 57	3432	116 58 37	3435	118 20 13	3438	119 41 47	3440
	Pollux	W.	88 14 49	3067	89 43 39	3070	91 12 25	3072	92 41 8	3073
	MARS	W.	81 51 27	3305	83 15 33	3308	84 39 35	3310	86 3 35	3312
	Regulus	W.	52 2 18	3087	53 30 43	3089	54 59 6	3090	56 27 27	3091
	Antares	E.	48 31 7	3079	47 2 32	3082	45 34 1	3085	44 5 34	3088
	α Aquilæ	E.	97 3 41	3887	95 50 8	3885	94 36 33	3884	93 22 56	3883
17	SUN	W.	126 29 8	3445	127 50 34	3445	129 12 0	3444	130 33 27	3442
	Pollux	W.	100 4 23	3077	101 33 1	3076	103 1 39	3075	104 30 19	3074
	MARS	W.	93 3 9	3315	94 27 3	3314	95 50 57	3313	97 14 53	3312
	Regulus	W.	63 49 2	3091	65 17 22	3090	66 45 44	3089	68 14 7	3087
	JUPITER	W.	27 23 32	3114	28 51 24	3112	30 19 19	3109	31 47 18	3106
	Antares	E.	36 44 0	3097	35 15 47	3099	33 47 36	3100	32 19 27	3101
	α Aquilæ	E.	87 14 53	3887	86 1 20	3889	84 47 49	3892	83 34 21	3896
18	Pollux	W.	111 54 9	3063	113 23 4	3060	114 52 3	3057	116 21 6	3054
	MARS	W.	104 15 2	3300	105 39 13	3297	107 3 27	3294	108 27 46	3290
	Regulus	W.	75 36 40	3074	77 5 21	3071	78 34 6	3067	80 2 56	3063
	JUPITER	W.	39 8 5	3090	40 36 27	3086	42 4 54	3082	43 33 26	3078
	Spica	W.	21 51 12	3178	23 17 48	3160	24 44 45	3145	26 12 0	3133
	Antares	E.	24 59 4	3110	23 31 6	3114	22 3 13	3118	20 35 25	3122
	α Aquilæ	E.	77 28 7	3922	76 15 10	3930	75 2 21	3939	73 49 41	3948
	Fomalhaut	E.	107 35 52	3244	106 10 35	3238	104 45 11	3232	103 19 40	3226
19	MARS	W.	115 30 34	3266	116 55 25	3261	118 20 22	3255	119 45 26	3250
	Regulus	W.	87 28 25	3039	88 57 49	3034	90 27 19	3028	91 56 56	3022
	JUPITER	W.	50 57 31	3052	52 26 39	3047	53 55 54	3041	55 25 16	3035
	Spica	W.	33 31 49	3078	35 0 25	3069	36 29 12	3060	37 58 10	3052
	α Aquilæ	E.	67 49 5	4015	66 37 40	4032	65 26 32	4051	64 15 42	4072
	Fomalhaut	E.	96 10 16	3196	94 44 2	3190	93 17 41	3184	91 51 12	3178
20	Regulus	W.	99 26 56	2991	100 57 20	2984	102 27 52	2977	103 58 33	2970
	JUPITER	W.	62 54 2	3002	64 24 12	2996	65 54 30	2990	67 24 57	2981
	Spica	W.	45 25 41	3009	46 55 43	3000	48 25 56	2991	49 56 20	2983
	α Aquilæ	E.	58 27 20	4211	57 19 4	4247	56 11 22	4287	55 4 16	4330
	Fomalhaut	E.	84 36 59	3118	83 9 47	3142	81 42 28	3136	80 15 2	3131
21	Regulus	W.	111 34 11	2935	113 5 46	2927	114 37 30	2920	116 9 24	2912
	JUPITER	W.	74 59 32	2943	76 30 56	2936	78 2 29	2928	79 34 12	2920
	Spica	W.	57 30 56	2941	59 2 23	2932	60 34 1	2923	62 5 51	2915

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
21	Fomalhaut E.	78 47 30	3125	77 19 51	3120	75 52 6	3115	74 24 14	3110
22	JUPITER W.	81 6 6	2912	82 38 10	2904	84 10 24	2895	85 42 49	2887
	Spica W.	63 37 51	2906	65 10 2	2898	66 42 24	2889	68 14 57	2880
	Antares W.	17 50 59	2970	19 21 49	2950	20 53 4	2933	22 24 41	2917
	Fomalhaut E.	67 3 35	3090	65 35 13	3087	64 6 47	3084	62 38 18	3082
23	JUPITER W.	93 27 32	2846	95 1 1	2838	96 34 40	2829	98 8 30	2821
	Spica W.	76 0 32	2836	77 34 13	2828	79 8 4	2819	80 42 7	2810
	Antares W.	30 7 27	2851	31 40 49	2840	33 14 25	2829	34 48 15	2818
	Fomalhaut E.	55 15 28	3082	53 46 56	3084	52 18 26	3087	50 50 0	3091
	SATURN E.	115 0 4	2848	113 26 39	2840	111 53 4	2831	110 19 17	2823
	α Arietis E.	117 52 14	2937	116 20 42	2926	114 48 56	2914	113 16 55	2902
24	JUPITER W.	106 0 27	2778	107 35 23	2769	109 10 31	2761	110 45 50	2753
	Spica W.	88 35 14	2767	90 10 26	2759	91 45 48	2750	93 21 22	2741
	Antares W.	42 40 48	2768	44 15 58	2759	45 51 20	2749	47 26 55	2739
	Fomalhaut E.	43 29 51	3138	42 2 28	3154	40 35 25	3174	39 8 45	3197
	SATURN E.	102 27 34	2779	100 52 39	2771	99 17 33	2762	97 42 15	2753
	α Arietis E.	105 33 20	2849	103 59 56	2840	102 26 20	2830	100 52 31	2820
25	Spica W.	101 22 4	2698	102 58 46	2689	104 35 40	2681	106 12 45	2672
	Antares W.	55 27 58	2693	57 4 47	2684	58 41 49	2675	60 19 3	2665
	SATURN E.	89 42 50	2709	88 6 22	2701	86 29 43	2692	84 52 52	2683
	α Arietis E.	93 0 20	2774	91 25 18	2765	89 50 4	2756	88 14 38	2747
26	Antares W.	68 28 19	2620	70 6 47	2610	71 45 28	2601	73 24 21	2593
	SATURN E.	76 45 34	2638	75 7 31	2629	73 29 15	2620	71 50 47	2611
	α Arietis E.	80 14 43	2706	78 38 11	2698	77 1 29	2691	75 24 37	2684
	Aldebaran E.	110 33 31	2641	108 55 32	2632	107 17 20	2622	105 38 55	2613
	SUN E.	136 28 43	2948	134 57 25	2938	133 25 54	2928	131 54 10	2918
27	Antares W.	81 41 51	2547	83 21 59	2538	85 2 19	2529	86 42 53	2520
	SATURN E.	63 35 22	2565	61 55 39	2556	60 15 44	2547	58 35 36	2538
	α Arietis E.	67 17 52	2649	65 40 4	2643	64 2 8	2638	62 24 4	2632
	Aldebaran E.	97 23 40	2566	95 43 59	2557	94 4 5	2548	92 23 58	2539
	SUN E.	124 12 21	2868	122 39 21	2858	121 6 8	2848	119 32 42	2838
28	Antares W.	95 8 51	2474	96 50 41	2465	98 32 44	2455	100 15 0	2446
	SATURN E.	50 11 43	2492	48 30 18	2482	46 48 39	2472	45 6 46	2463
	α Arietis E.	54 12 1	2611	52 33 21	2608	50 54 37	2607	49 15 51	2606
	Aldebaran E.	84 0 13	2493	82 18 50	2484	80 37 15	2475	78 55 27	2466
	SUN E.	111 42 18	2788	110 7 34	2778	108 32 37	2768	106 57 27	2757
29	Antares W.	108 49 37	2401	110 33 11	2391	112 16 58	2382	114 0 58	2373
	SATURN E.	36 34 8	2417	34 50 56	2408	33 7 32	2398	31 23 54	2388
	Aldebaran E.	70 23 17	2422	68 40 14	2414	66 56 59	2405	65 13 32	2397
	SUN E.	98 58 17	2707	97 21 47	2698	95 45 5	2688	94 8 9	2678
30	SATURN E.	22 42 24	2343	20 57 27	2335	19 12 18	2326	17 26 56	2317
	Aldebaran E.	56 33 24	2359	54 48 50	2352	53 4 5	2345	51 19 11	2339
	SUN E.	86 0 13	2630	84 21 59	2621	82 43 32	2612	81 4 53	2602

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
21	Fomalhaut E.	72 56 17	3105	71 28 14	3101	70 0 6	3097	68 31 53	3093
22	JUPITER W.	87 15 24	2879	88 48 10	2870	90 21 7	2862	91 54 14	2854
	Spica W.	69 47 42	2871	71 20 38	2863	72 53 44	2854	74 27 2	2845
	Antares W.	23 56 38	2902	25 28 55	2888	27 1 29	2875	28 34 20	2862
	Fomalhaut E.	61 9 46	3080	59 41 12	3079	58 12 37	3079	56 44 2	3080
23	JUPITER W.	99 42 31	2812	101 16 43	2803	102 51 7	2795	104 25 42	2787
	Spica W.	82 16 22	2801	83 50 48	2793	85 25 25	2784	87 0 14	2775
	Antares W.	36 22 19	2808	37 56 36	2798	39 31 7	2788	41 5 51	2778
	Fomalhaut E.	49 21 39	3097	47 53 26	3105	46 25 22	3114	44 57 30	3125
	SATURN E.	108 45 19	2814	107 11 10	2805	105 36 49	2797	104 2 17	2788
	α Arietis E.	111 44 39	2891	110 12 9	2881	108 39 27	2870	107 6 31	2859
24	JUPITER W.	112 21 20	2744	113 57 1	2735	115 32 54	2727	117 8 58	2719
	Spica W.	94 57 8	2732	96 33 5	2724	98 9 13	2715	99 45 33	2707
	Antares W.	49 2 43	2730	50 38 43	2720	52 14 56	2711	53 51 21	2702
	Fomalhaut E.	37 42 31	3221	36 16 49	3256	34 51 46	3294	33 27 28	3338
	SATURN E.	96 6 45	2744	94 31 4	2735	92 55 11	2726	91 19 6	2718
	α Arietis E.	99 18 29	2811	97 44 15	2801	96 9 49	2792	94 35 11	2783
25	Spica W.	107 50 2	2664	109 27 30	2656	111 5 9	2647	112 43 0	2638
	Antares W.	61 56 30	2656	63 34 9	2647	65 12 0	2638	66 50 3	2629
	SATURN E.	83 15 48	2674	81 38 33	2665	80 1 5	2656	78 23 26	2647
	α Arietis E.	86 39 1	2739	85 3 13	2731	83 27 14	2722	81 51 4	2714
26	Antares W.	75 3 26	2584	76 42 43	2574	78 22 13	2565	80 1 56	2556
	SATURN E.	70 12 7	2602	68 33 15	2593	66 54 10	2583	65 14 52	2574
	α Arietis E.	73 47 35	2676	72 10 23	2669	70 33 2	2662	68 55 31	2656
	Aldebaran E.	104 0 18	2604	102 21 28	2594	100 42 25	2585	99 3 9	2575
	SUN E.	130 22 14	2908	128 50 5	2898	127 17 43	2888	125 45 8	2878
27	Antares W.	88 23 39	2511	90 4 38	2502	91 45 49	2492	93 27 14	2483
	SATURN E.	56 55 15	2529	55 14 42	2519	53 33 55	2510	51 52 55	2501
	α Arietis E.	60 45 52	2626	59 7 33	2622	57 29 8	2618	55 50 37	2614
	Aldebaran E.	90 43 38	2530	89 3 6	2520	87 22 21	2511	85 41 23	2502
	SUN E.	117 59 3	2828	116 25 12	2818	114 51 7	2808	113 16 49	2798
28	Antares W.	101 57 30	2437	103 40 12	2428	105 23 7	2419	107 6 16	2410
	SATURN E.	43 24 41	2454	41 42 22	2445	39 59 51	2435	38 17 6	2426
	α Arietis E.	47 37 4	2606	45 58 17	2607	44 19 32	2610	42 40 51	2614
	Aldebaran E.	77 13 26	2457	75 31 12	2448	73 48 46	2440	72 6 8	2431
	SUN E.	105 22 3	2747	103 46 26	2738	102 10 37	2728	100 34 34	2717
29	Antares W.	115 45 11	2364	117 29 37	2356	119 14 15	2347	120 59 6	2339
	SATURN E.	29 40 2	2379	27 55 57	2370	26 11 39	2361	24 27 8	2352
	Aldebaran E.	63 29 53	2389	61 46 2	2381	60 2 1	2373	58 17 48	2366
	SUN E.	92 31 0	2669	90 53 38	2659	89 16 3	2649	87 38 14	2640
30	SATURN E.	15 41 21	2309	13 55 34	2301	12 9 36	2293	10 23 26	2285
	Aldebaran E.	49 34 8	2333	47 48 57	2327	46 3 37	2322	44 18 10	2317
	SUN E.	79 26 1	2593	77 46 57	2585	76 7 42	2577	74 28 15	2568

## AT GREENWICH APPARENT NOON.

THE SUN'S													
Day of the Week.	Day of the Month.	Apparent Right Ascension.			Diff. for 1 Hour.	Apparent Declination.			Diff. for 1 Hour.	Semi-diameter	Sidereal Time of Semi-diameter Passing Meridian	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		h	m	s	s	°	'	"	"	'	s	m	s
Frid.	1	6	38	5.64	10.349	N.23	9	47.5	- 9.41	15	45.69	68.76	3 26.85 0.491
Sat.	2	6	42	13.95	10.339	23	5	49.5	10.43	15	45.67	68.72	3 38.55 0.482
SUN.	3	6	45	22.00	10.328	23	1	27.1	11.44	15	45.66	68.69	3 50.00 0.471
Mon.	4	6	50	29.78	10.316	22	56	40.6	- 12.45	15	45.65	68.65	4 1.19 0.460
Tues.	5	6	54	37.26	10.304	22	51	30.1	13.45	15	45.65	68.61	4 12.09 0.447
Wed.	6	6	58	44.43	10.290	22	45	55.6	14.44	15	45.66	68.57	4 22.68 0.434
Thur.	7	7	2	51.26	10.276	22	39	57.4	- 15.43	15	45.67	68.52	4 32.93 0.420
Frid.	8	7	6	57.73	10.260	22	33	35.6	16.41	15	45.69	68.47	4 42.81 0.404
Sat.	9	7	11	3.81	10.243	22	26	50.3	17.38	15	45.71	68.41	4 52.31 0.387
SUN.	10	7	15	9.47	10.225	22	19	41.7	- 18.35	15	45.74	68.35	5 1.40 0.369
Mon.	11	7	19	14.70	10.207	22	12	10.0	19.31	15	45.78	68.29	5 10.04 0.351
Tues.	12	7	23	19.48	10.188	22	4	15.4	20.26	15	45.82	68.23	5 18.23 0.332
Wed.	13	7	27	23.80	10.169	21	55	58.1	- 21.20	15	45.86	68.17	5 25.96 0.312
Thur.	14	7	31	27.62	10.148	21	47	18.1	22.14	15	45.91	68.10	5 33.21 0.291
Frid.	15	7	35	30.94	10.127	21	38	15.8	23.07	15	45.96	68.03	5 39.95 0.270
Sat.	16	7	39	33.76	10.106	21	28	51.5	- 23.98	15	46.02	67.96	5 46.19 0.249
SUN.	17	7	43	36.06	10.084	21	19	5.2	24.89	15	46.08	67.89	5 51.91 0.227
Mon.	18	7	47	37.82	10.062	21	8	57.2	25.78	15	46.14	67.82	5 57.10 0.205
Tues.	19	7	51	39.04	10.039	20	58	27.8	- 26.67	15	46.21	67.75	6 1.76 0.182
Wed.	20	7	55	39.71	10.016	20	47	37.3	27.55	15	46.28	67.67	6 5.86 0.159
Thur.	21	7	59	39.82	9.992	20	36	25.8	28.42	15	46.36	67.59	6 9.40 0.136
Frid.	22	8	3	39.36	9.969	20	24	53.5	- 29.28	15	46.44	67.51	6 12.38 0.112
Sat.	23	8	7	38.33	9.945	20	13	0.6	30.13	15	46.52	67.43	6 14.80 0.089
SUN.	24	8	11	36.74	9.921	20	0	47.5	30.97	15	46.60	67.34	6 16.65 0.065
Mon.	25	8	15	34.58	9.898	19	48	14.4	- 31.80	15	46.69	67.26	6 17.93 0.041
Tues.	26	8	19	31.85	9.874	19	35	21.5	32.61	15	46.78	67.18	6 18.64 0.017
Wed.	27	8	23	28.54	9.850	19	22	9.2	33.42	15	46.88	67.10	6 18.77 0.007
Thur.	28	8	27	24.65	9.826	19	8	37.5	- 34.22	15	46.98	67.01	6 18.32 0.031
Frid.	29	8	31	20.18	9.801	18	54	46.7	35.02	15	47.08	66.93	6 17.29 0.055
Sat.	30	8	35	15.13	9.777	18	40	37.1	35.79	15	47.18	66.84	6 15.68 0.079
SUN.	31	8	39	9.50	9.753	18	26	9.1	36.55	15	47.29	66.75	6 13.49 0.103
Mon.	32	8	43	3.27	9.728	N.18	11	22.9	- 37.31	15	47.40	66.66	6 10.73 0.128

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0° 19' from the sidereal time.  
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.



## AT GREENWICH MEAN NOON.

		THE SUN'S				Equation of Time, to be Subtracted from Mean Time.		Diff. for 1 Hour.		Sidereal Time, or Right Ascension of Mean Sun.	
Day of the Week.	Day of the Month.	Apparent Right Ascension.			Diff. for 1 Hour.	Apparent Declination.			Diff. for 1 Hour.		
		h	m	s	s	°	'	"	"	m	s
Frid.	1	6	38	5.04	10.349	N.23	9	48.0	- 9.41	3	26.80
Sat.	2	6	42	13.31	10.339	23	5	50.1	10.42	3	38.51
SUN.	3	6	46	21.33	10.328	23	1	27.8	11.43	3	49.97
Mon.	4	6	50	29.08	10.316	22	56	41.4	- 12.44	4	1.16
Tues.	5	6	54	36.53	10.304	22	51	31.0	13.44	4	12.05
Wed.	6	6	58	43.67	10.290	22	45	56.7	14.43	4	22.63
Thur.	7	7	2	50.47	10.276	22	39	58.6	- 15.42	4	32.88
Frid.	8	7	6	56.92	10.260	22	33	36.9	16.40	4	42.77
Sat.	9	7	11	2.97	10.243	22	26	51.7	17.37	4	52.26
SUN.	10	7	15	8.61	10.225	22	19	43.3	- 18.34	5	1.34
Mon.	11	7	19	13.81	10.207	22	12	11.7	19.30	5	9.99
Tues.	12	7	23	18.57	10.188	22	4	17.2	20.25	5	18.19
Wed.	13	7	27	22.87	10.169	21	56	0.0	- 21.19	5	25.92
Thur.	14	7	31	26.67	10.148	21	47	20.2	22.13	5	33.17
Frid.	15	7	35	29.98	10.127	21	38	18.0	23.05	5	39.92
Sat.	16	7	39	32.78	10.106	21	28	53.7	- 23.97	5	46.16
SUN.	17	7	43	35.06	10.084	21	19	7.6	24.87	5	51.89
Mon.	18	7	47	36.81	10.062	21	8	59.8	25.77	5	57.08
Tues.	19	7	51	38.02	10.039	20	58	30.5	- 26.66	6	1.73
Wed.	20	7	55	38.68	10.016	20	47	40.1	27.54	6	5.83
Thur.	21	7	59	38.78	9.992	20	36	28.7	28.41	6	9.37
Frid.	22	8	3	38.32	9.969	20	24	56.5	- 29.27	6	12.36
Sat.	23	8	7	37.30	9.945	20	13	3.7	30.12	6	14.78
SUN.	24	8	11	35.70	9.922	20	0	50.7	30.96	6	16.63
Mon.	25	8	15	33.54	9.898	19	48	17.8	- 31.79	6	17.91
Tues.	26	8	19	30.81	9.874	19	35	25.0	32.61	6	18.62
Wed.	27	8	23	27.50	9.850	19	22	12.7	33.42	6	18.75
Thur.	28	8	27	23.61	9.826	19	8	41.1	- 34.22	6	18.31
Frid.	29	8	31	19.14	9.801	18	54	50.4	35.00	6	17.29
Sat.	30	8	35	14.11	9.777	18	40	40.9	35.78	6	15.69
SUN.	31	8	39	8.48	9.753	18	26	12.9	36.54	6	13.51
Mon.	32	8	43	2.27	9.729	N.18	11	26.8	- 37.30	6	10.74

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
 The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,  
 +9°.8565.  
 (Table III.)

AT GREENWICH MEAN NOON.											
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.		
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.						
		$\lambda$	$\lambda'$								
		$^{\circ}$	$'$	$''$	$'$	$''$	$''$			$^{\text{h}}$ $^{\text{m}}$ $^{\text{s}}$	
1	182	98	45	10.2	44	59.0	143.02	— 0.34	0.007 2023	+ 3.5	17 22 30.50
2	183	99	42	23.0	42	11.6	143.03	0.21	0.007 2096	2.6	17 18 34.58
3	184	100	39	35.9	39	24.3	143.04	— 0.06	0.007 2145	1.6	17 14 38.67
4	185	101	36	49.0	36	37.3	143.05	+ 0.09	0.007 2170	+ 0.5	17 10 42.76
5	186	102	34	2.4	33	50.5	143.06	0.23	0.007 2169	— 0.6	17 6 46.85
6	187	103	31	15.9	31	3.8	143.06	0.35	0.007 2141	1.7	17 2 50.93
7	188	104	28	29.5	28	17.2	143.07	+ 0.45	0.007 2085	— 2.8	16 58 55.02
8	189	105	25	43.2	25	30.7	143.07	0.53	0.007 2003	3.9	16 54 59.11
9	190	106	22	56.8	22	44.2	143.07	0.57	0.007 1895	5.0	16 51 3.20
10	191	107	20	10.5	19	57.7	143.07	+ 0.59	0.007 1761	— 6.1	16 47 7.29
11	192	108	17	24.2	17	11.2	143.07	0.58	0.007 1603	7.2	16 43 11.37
12	193	109	14	37.8	14	24.6	143.07	0.53	0.007 1421	8.2	16 39 15.46
13	194	110	11	51.5	11	38.1	143.07	+ 0.47	0.007 1217	— 9.0	16 35 19.55
14	195	111	9	5.2	8	51.6	143.07	0.38	0.007 0993	9.8	16 31 23.64
15	196	112	6	19.0	6	5.2	143.08	0.28	0.007 0748	10.6	16 27 27.73
16	197	113	3	32.9	3	18.9	143.08	+ 0.17	0.007 0484	— 11.4	16 23 31.81
17	198	114	0	46.9	0	32.8	143.09	+ 0.04	0.007 0203	12.1	16 19 35.90
18	199	114	58	1.1	57	46.9	143.10	— 0.08	0.006 9904	12.8	16 15 39.99
19	200	115	55	15.6	55	1.2	143.11	— 0.19	0.006 9589	— 13.4	16 11 44.08
20	201	116	52	30.5	52	15.9	143.13	0.29	0.006 9259	14.0	16 7 48.17
21	202	117	49	45.8	49	31.0	143.15	0.38	0.006 8914	14.6	16 3 52.25
22	203	118	47	1.6	46	46.6	143.17	— 0.44	0.006 8555	— 15.2	15 59 56.34
23	204	119	44	17.9	44	2.8	143.20	0.48	0.006 8182	15.8	15 56 0.43
24	205	120	41	34.9	41	19.7	143.23	0.48	0.006 7796	16.4	15 52 4.52
25	206	121	38	52.7	38	37.3	143.26	— 0.45	0.006 7396	— 17.0	15 48 8.61
26	207	122	36	11.4	35	55.8	143.29	0.39	0.006 6982	17.6	15 44 12.70
27	208	123	33	31.0	33	15.3	143.34	0.31	0.006 6552	18.2	15 40 16.79
28	209	124	30	51.6	30	35.8	143.38	— 0.20	0.006 6105	— 18.9	15 36 20.88
29	210	125	28	13.3	27	57.3	143.43	— 0.07	0.006 5641	19.7	15 32 24.97
30	211	126	25	36.1	25	19.9	143.47	+ 0.07	0.006 5159	20.5	15 28 29.06
31	212	127	23	0.0	22	43.7	143.52	0.21	0.006 4656	21.4	15 24 33.15
32	213	128	20	25.1	20	8.6	143.56	+ 0.34	0.006 4131	— 22.3	15 20 37.24
NOTE.—The numbers in column $\lambda$ correspond to the true equinox of the date; in column $\lambda'$ to the mean equinox of January 0 <sup>d</sup> .o.										Diff. for 1 Hour, — 9 <sup>s</sup> .8296. (Table II.)	

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	' "	' "	' "	"	' "	"	h m	m	d
1	16 14.3	16 17.4	59 29.9	+ 1.01	59 41.1	+ 0.87	19 46.0	2.17	23.9
2	16 20.0	16 22.0	59 50.6	0.70	59 58.0	0.52	20 39.9	2.32	24.9
3	16 23.3	16 23.9	60 2.9	+ 0.30	60 5.1	+ 0.06	21 37.7	2.49	25.9
4	16 23.7	16 22.6	60 4.3	- 0.20	60 0.4	- 0.46	22 39.0	2.61	26.9
5	16 20.7	16 17.9	59 53.3	0.72	59 43.0	0.98	23 42.1	2.63	27.9
6	16 14.3	16 9.9	59 29.7	1.23	59 13.6	1.45	0	.	28.9
7	16 4.9	15 59.3	58 55.1	- 1.63	58 34.5	- 1.78	0 44.0	2.52	0.6
8	15 53.2	15 46.9	58 12.4	1.90	57 49.1	1.98	1 42.4	2.34	1.6
9	15 40.3	15 33.8	57 25.2	2.00	57 1.3	1.98	2 36.1	2.13	2.6
10	15 27.4	15 21.2	56 37.7	- 1.93	56 15.0	- 1.85	3 25.0	1.95	3.6
11	15 15.3	15 9.9	55 53.4	1.73	55 33.4	1.59	4 9.9	1.81	4.6
12	15 4.9	15 0.6	55 15.3	1.43	54 59.2	1.25	4 52.0	1.71	5.6
13	14 56.8	14 53.7	54 45.4	- 1.05	54 34.0	- 0.85	5 32.6	1.67	6.6
14	14 51.3	14 49.5	54 25.1	0.64	54 18.8	- 0.42	6 12.9	1.68	7.6
15	14 48.5	14 48.2	54 15.0	- 0.21	54 13.7	0.00	6 53.9	1.73	8.6
16	14 48.5	14 49.5	54 14.9	+ 0.20	54 18.5	+ 0.39	7 36.6	1.83	9.6
17	14 51.1	14 53.2	54 24.4	0.58	54 32.3	0.74	8 22.0	1.96	10.6
18	14 55.9	14 59.0	54 42.1	0.89	54 53.7	1.03	9 10.5	2.09	11.6
19	15 2.6	15 6.5	55 6.7	+ 1.14	55 20.9	+ 1.23	10 2.1	2.20	12.6
20	15 10.6	15 15.0	55 36.2	1.30	55 52.2	1.35	10 56.0	2.28	13.6
21	15 19.5	15 24.0	56 8.6	1.38	56 25.3	1.39	11 50.9	2.29	14.6
22	15 28.6	15 33.1	56 42.0	+ 1.38	56 58.4	+ 1.36	12 45.4	2.24	15.6
23	15 37.4	15 41.6	57 14.4	1.31	57 29.8	1.25	13 38.1	2.15	16.6
24	15 45.6	15 49.3	57 44.4	1.18	57 58.2	1.11	14 28.8	2.06	17.6
25	15 52.8	15 56.1	58 11.0	+ 1.03	58 22.9	+ 0.94	15 17.6	2.00	18.6
26	15 59.0	16 1.7	58 33.7	0.87	58 43.5	0.78	16 5.3	1.98	19.6
27	16 4.1	16 6.2	58 52.3	0.69	59 0.0	0.60	16 53.1	2.01	20.6
28	16 8.0	16 9.5	59 6.6	+ 0.51	59 12.2	+ 0.42	17 42.2	2.09	21.6
29	16 10.7	16 11.6	59 16.6	0.32	59 19.8	+ 0.22	18 33.8	2.22	22.6
30	16 12.1	16 12.3	59 21.8	+ 0.11	59 22.3	- 0.02	19 28.8	2.37	23.6
31	16 12.0	16 11.3	59 21.3	- 0.15	59 18.7	0.29	20 27.3	2.50	24.6
32	16 10.1	16 8.4	59 14.4	- 0.44	59 8.3	- 0.59	21 28.3	2.56	25.6

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 1.					SUNDAY 3.				
0	1 40 14.78	2.1653	N. 7 29 51.4	15.408	0	3 29 54.28	2.4242	N. 18 43 31.3	11.988
1	1 42 24.81	2.1692	7 45 14.9	15.376	1	3 32 19.92	2.4305	18 55 27.1	11.872
2	1 44 35.08	2.1738	8 0 36.5	15.343	2	3 34 45.94	2.4368	19 7 15.9	11.754
3	1 46 45.59	2.1773	8 15 56.1	15.308	3	3 37 12.33	2.4430	19 18 57.6	11.636
4	1 48 56.35	2.1814	8 31 13.5	15.272	4	3 39 39.10	2.4493	19 30 32.2	11.516
5	1 51 7.36	2.1856	8 46 28.7	15.235	5	3 42 6.25	2.4557	19 41 59.5	11.393
6	1 53 18.62	2.1898	9 1 41.7	15.197	6	3 44 33.78	2.4619	19 53 19.4	11.268
7	1 55 30.14	2.1942	9 16 52.3	15.155	7	3 47 1.68	2.4682	20 4 31.7	11.142
8	1 57 41.93	2.1988	9 32 0.3	15.112	8	3 49 29.96	2.4744	20 15 36.4	11.014
9	1 59 53.99	2.2033	9 47 5.7	15.068	9	3 51 58.61	2.4807	20 26 33.4	10.885
10	2 2 6.32	2.2078	10 2 8.5	15.023	10	3 54 27.64	2.4868	20 37 22.6	10.754
11	2 4 18.93	2.2125	10 17 8.4	14.975	11	3 56 57.03	2.4929	20 48 3.9	10.621
12	2 6 31.82	2.2173	10 32 5.5	14.927	12	3 59 26.79	2.4991	20 58 37.1	10.486
13	2 8 45.00	2.2221	10 46 59.6	14.875	13	4 1 56.92	2.5052	21 9 2.2	10.349
14	2 10 58.47	2.2269	11 1 50.5	14.823	14	4 4 27.41	2.5112	21 19 19.0	10.210
15	2 13 12.23	2.2318	11 16 38.3	14.769	15	4 6 58.26	2.5172	21 29 27.4	10.070
16	2 15 26.29	2.2368	11 31 22.8	14.713	16	4 9 29.47	2.5232	21 39 27.4	9.928
17	2 17 40.65	2.2419	11 46 3.8	14.654	17	4 12 1.04	2.5291	21 49 18.8	9.785
18	2 19 55.32	2.2471	12 0 41.3	14.596	18	4 14 32.96	2.5349	21 59 1.6	9.640
19	2 22 10.30	2.2523	12 15 15.3	14.535	19	4 17 5.23	2.5407	22 8 35.6	9.493
20	2 24 25.60	2.2577	12 29 45.5	14.472	20	4 19 37.84	2.5464	22 18 0.8	9.345
21	2 26 41.22	2.2630	12 44 11.9	14.408	21	4 22 10.80	2.5519	22 27 17.0	9.195
22	2 28 57.16	2.2683	12 58 34.4	14.342	22	4 24 44.09	2.5576	22 36 24.2	9.043
23	2 31 13.42	2.2738	N. 13 12 52.9	14.273	23	4 27 17.71	2.5631	N. 22 45 22.2	8.890
SATURDAY 2.					MONDAY 4.				
0	2 33 30.01	2.2793	N. 13 27 7.2	14.203	0	4 29 51.66	2.5686	N. 22 54 11.0	8.736
1	2 35 46.94	2.2849	13 41 17.3	14.133	1	4 32 25.94	2.5740	23 2 50.5	8.579
2	2 38 4.20	2.2905	13 55 23.1	14.059	2	4 35 0.54	2.5793	23 11 20.5	8.421
3	2 40 21.80	2.2962	14 9 24.4	13.983	3	4 37 35.45	2.5844	23 19 41.0	8.262
4	2 42 39.74	2.3019	14 23 21.1	13.907	4	4 40 10.67	2.5895	23 27 51.9	8.102
5	2 44 58.03	2.3078	14 37 13.2	13.828	5	4 42 46.19	2.5945	23 35 53.2	7.940
6	2 47 16.67	2.3136	14 51 0.5	13.748	6	4 45 22.01	2.5994	23 43 44.7	7.777
7	2 49 35.66	2.3194	15 4 42.9	13.666	7	4 47 58.12	2.6043	23 51 26.4	7.612
8	2 51 55.00	2.3253	15 18 20.4	13.582	8	4 50 34.52	2.6089	23 58 58.1	7.445
9	2 54 14.70	2.3313	15 31 52.7	13.495	9	4 53 11.19	2.6135	24 6 19.8	7.278
10	2 56 34.76	2.3373	15 45 19.8	13.408	10	4 55 48.14	2.6180	24 13 31.4	7.109
11	2 58 55.18	2.3433	15 58 41.6	13.318	11	4 58 25.35	2.6223	24 20 32.9	6.939
12	3 1 15.96	2.3494	16 11 58.0	13.228	12	5 1 2.82	2.6266	24 27 24.1	6.768
13	3 3 37.11	2.3555	16 25 8.9	13.134	13	5 3 40.54	2.6308	24 34 5.0	6.595
14	3 5 58.62	2.3616	16 38 14.1	13.038	14	5 6 18.51	2.6348	24 40 35.5	6.422
15	3 8 20.50	2.3678	16 51 13.5	12.942	15	5 8 56.71	2.6386	24 46 55.6	6.248
16	3 10 42.76	2.3741	17 4 7.1	12.843	16	5 11 35.14	2.6423	24 53 5.2	6.072
17	3 13 5.39	2.3803	17 16 54.7	12.743	17	5 14 13.78	2.6458	24 59 4.2	5.894
18	3 15 28.39	2.3864	17 29 36.2	12.640	18	5 16 52.64	2.6493	25 4 52.5	5.717
19	3 17 51.76	2.3927	17 42 11.5	12.536	19	5 19 31.70	2.6526	25 10 30.2	5.538
20	3 20 15.51	2.3990	17 54 40.5	12.430	20	5 22 10.95	2.6558	25 15 57.1	5.358
21	3 22 39.64	2.4053	18 7 3.1	12.323	21	5 24 50.39	2.6588	25 21 13.2	5.178
22	3 25 4.14	2.4115	18 19 19.2	12.213	22	5 27 30.01	2.6617	25 26 18.4	4.996
23	3 27 29.02	2.4178	18 31 28.6	12.101	23	5 30 9.80	2.6644	25 31 12.7	4.814
24	3 29 54.28	2.4242	N. 18 43 31.3	11.988	24	5 32 49.74	2.6669	N. 25 35 56.1	4.632

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 5.					THURSDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	5 32 49.74	2.6669	N.25 35 56.1	4.632	0	7 40 31.70	2.5882	N.25 43 23.9	4.191
1	5 35 29.83	2.6693	25 40 28.5	4.448	1	7 43 6.82	2.5866	25 39 7.4	4.358
2	5 38 10.06	2.6716	25 44 49.8	4.263	2	7 45 41.61	2.5769	25 34 41.0	4.523
3	5 40 50.42	2.6737	25 49 0.0	4.078	3	7 48 16.05	2.5711	25 30 4.6	4.688
4	5 43 30.90	2.6756	25 52 59.1	3.892	4	7 50 50.14	2.5652	25 25 18.4	4.851
5	5 46 11.49	2.6773	25 56 47.0	3.706	5	7 53 23.87	2.5592	25 20 22.5	5.013
6	5 48 52.18	2.6789	26 0 23.8	3.519	6	7 55 57.24	2.5531	25 15 16.9	5.173
7	5 51 32.96	2.6803	26 3 49.3	3.332	7	7 58 30.24	2.5468	25 10 1.7	5.332
8	5 54 13.82	2.6816	26 7 3.6	3.144	8	8 1 2.86	2.5404	25 4 37.0	5.490
9	5 56 54.75	2.6827	26 10 6.6	2.957	9	8 3 35.09	2.5340	24 59 2.9	5.646
10	5 59 35.74	2.6835	26 12 58.4	2.768	10	8 6 6.94	2.5276	24 53 19.5	5.801
11	6 2 16.77	2.6842	26 15 38.8	2.579	11	8 8 38.40	2.5209	24 47 26.8	5.955
12	6 4 57.84	2.6848	26 18 7.9	2.391	12	8 11 9.45	2.5142	24 41 24.9	6.107
13	6 7 38.94	2.6851	26 20 25.7	2.202	13	8 13 40.10	2.5073	24 35 14.0	6.256
14	6 10 20.05	2.6853	26 22 32.1	2.012	14	8 16 10.33	2.5004	24 28 54.2	6.404
15	6 13 1.17	2.6853	26 24 27.1	1.823	15	8 18 40.15	2.4935	24 22 25.5	6.552
16	6 15 42.28	2.6851	26 26 10.8	1.633	16	8 21 9.55	2.4865	24 15 48.0	6.698
17	6 18 23.38	2.6848	26 27 43.1	1.444	17	8 23 38.53	2.4794	24 9 1.8	6.842
18	6 21 4.45	2.6842	26 29 4.1	1.255	18	8 26 7.08	2.4723	24 2 7.0	6.983
19	6 23 45.48	2.6834	26 30 13.7	1.066	19	8 28 35.20	2.4651	23 55 3.8	7.123
20	6 26 26.46	2.6825	26 31 12.0	0.877	20	8 31 2.89	2.4578	23 47 52.2	7.263
21	6 29 7.38	2.6815	26 31 58.9	0.688	21	8 33 30.13	2.4503	23 40 32.2	7.401
22	6 31 48.24	2.6803	26 32 34.5	0.499	22	8 35 56.93	2.4430	23 33 4.1	7.536
23	6 34 29.01	2.6788	N.26 32 58.8	0.311	23	8 38 23.29	2.4356	N.23 25 27.9	7.671
WEDNESDAY 6.					FRIDAY 8.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	6 37 9.69	2.6772	N.26 33 11.8	+0.123	0	8 40 49.20	2.4281	N.23 17 43.6	7.803
1	6 39 50.27	2.6753	26 33 13.5	-0.066	1	8 43 14.66	2.4205	23 9 51.5	7.933
2	6 42 30.73	2.6733	26 33 3.9	0.253	2	8 45 39.66	2.4129	23 1 51.6	8.063
3	6 45 11.07	2.6712	26 32 43.2	0.439	3	8 48 4.21	2.4054	22 53 44.0	8.190
4	6 47 51.27	2.6688	26 32 11.2	0.627	4	8 50 28.31	2.3978	22 45 28.8	8.316
5	6 50 31.33	2.6663	26 31 28.0	0.813	5	8 52 51.94	2.3900	22 37 6.1	8.440
6	6 53 11.23	2.6637	26 30 33.7	0.998	6	8 55 15.11	2.3823	22 28 36.0	8.562
7	6 55 50.97	2.6608	26 29 28.3	1.182	7	8 57 37.82	2.3747	22 19 58.7	8.683
8	6 58 30.53	2.6578	26 28 11.9	1.366	8	9 0 0.07	2.3669	22 11 14.1	8.803
9	7 1 9.91	2.6547	26 26 44.4	1.550	9	9 2 21.85	2.3592	22 2 22.4	8.920
10	7 3 49.09	2.6513	26 25 5.9	1.733	10	9 4 43.17	2.3514	21 53 23.7	9.035
11	7 6 28.06	2.6478	26 23 16.5	1.914	11	9 7 4.02	2.3437	21 44 18.2	9.148
12	7 9 6.82	2.6441	26 21 16.2	2.095	12	9 9 24.41	2.3359	21 35 5.9	9.261
13	7 11 45.35	2.6403	26 19 5.1	2.276	13	9 11 44.33	2.3281	21 25 46.9	9.371
14	7 14 23.65	2.6363	26 16 43.1	2.455	14	9 14 3.78	2.3203	21 16 21.4	9.479
15	7 17 1.70	2.6321	26 14 10.5	2.633	15	9 16 22.76	2.3125	21 6 49.4	9.587
16	7 19 39.50	2.6278	26 11 27.2	2.811	16	9 18 41.28	2.3048	20 57 11.0	9.693
17	7 22 17.04	2.6233	26 8 33.2	2.987	17	9 20 59.33	2.2970	20 47 26.3	9.796
18	7 24 54.30	2.6187	26 5 28.7	3.162	18	9 23 16.92	2.2892	20 37 35.5	9.898
19	7 27 31.28	2.6139	26 2 13.8	3.336	19	9 25 34.04	2.2814	20 27 38.6	9.999
20	7 30 7.97	2.6091	25 58 48.4	3.510	20	9 27 50.69	2.2737	20 17 35.6	10.099
21	7 32 44.37	2.6041	25 55 12.6	3.682	21	9 30 6.88	2.2660	20 7 26.7	10.196
22	7 35 20.46	2.5989	25 51 26.6	3.853	22	9 32 22.61	2.2583	19 57 12.1	10.291
23	7 37 56.24	2.5937	25 47 30.3	4.023	23	9 34 37.88	2.2507	19 46 51.8	10.384
24	7 40 31.70	2.5882	N.25 43 23.9	4.191	24	9 36 52.69	2.2430	N.19 36 26.0	10.477

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 9.					MONDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 36 52.69	2.2430	N. 19 36 26.0	10.477	0	11 16 36.63	1.9362	N. 9 55 34.3	13.210
1	9 39 7.04	2.2353	19 25 54.6	10.568	1	11 18 32.66	1.9315	9 42 20.9	13.237
2	9 41 20.93	2.2278	19 15 17.9	10.656	2	11 20 28.41	1.9268	9 29 5.9	13.263
3	9 43 34.37	2.2203	19 4 35.9	10.743	3	11 22 23.88	1.9223	9 15 49.4	13.288
4	9 45 47.36	2.2128	18 53 48.7	10.829	4	11 24 19.08	1.9178	9 2 31.4	13.311
5	9 47 59.90	2.2053	18 42 56.4	10.914	5	11 26 14.01	1.9133	8 49 12.1	13.333
6	9 50 11.99	2.1978	18 31 59.0	10.997	6	11 28 8.68	1.9091	8 35 51.4	13.356
7	9 52 23.63	2.1903	18 20 56.7	11.078	7	11 30 3.10	1.9049	8 22 29.4	13.377
8	9 54 34.83	2.1829	18 9 49.6	11.158	8	11 31 57.27	1.9007	8 9 6.2	13.396
9	9 56 45.58	2.1756	17 58 37.8	11.235	9	11 33 51.18	1.8965	7 55 41.9	13.414
10	9 58 55.90	2.1683	17 47 21.4	11.312	10	11 35 44.85	1.8926	7 42 16.5	13.432
11	10 1 5.78	2.1610	17 36 0.4	11.388	11	11 37 38.29	1.8887	7 28 50.0	13.449
12	10 3 15.22	2.1538	17 24 34.9	11.461	12	11 39 31.49	1.8848	7 15 22.6	13.465
13	10 5 24.24	2.1468	17 13 5.1	11.533	13	11 41 24.47	1.8811	7 1 54.2	13.480
14	10 7 32.83	2.1396	17 1 31.0	11.603	14	11 43 17.22	1.8773	6 48 25.0	13.494
15	10 9 40.99	2.1326	16 49 52.7	11.673	15	11 45 9.75	1.8737	6 34 54.9	13.508
16	10 11 48.74	2.1256	16 38 10.3	11.740	16	11 47 2.07	1.8703	6 21 24.0	13.521
17	10 13 56.06	2.1186	16 26 23.9	11.806	17	11 48 54.18	1.8668	6 7 52.4	13.532
18	10 16 2.97	2.1118	16 14 33.6	11.871	18	11 50 46.08	1.8633	5 54 20.2	13.543
19	10 18 9.47	2.1049	16 2 39.4	11.934	19	11 52 37.78	1.8601	5 40 47.3	13.553
20	10 20 15.56	2.0982	15 50 41.5	11.996	20	11 54 29.29	1.8569	5 27 13.9	13.561
21	10 22 21.25	2.0915	15 38 39.9	12.057	21	11 56 20.61	1.8538	5 13 40.0	13.569
22	10 24 26.54	2.0848	15 26 34.7	12.116	22	11 58 11.74	1.8507	5 0 5.6	13.577
23	10 26 31.43	2.0783	N. 15 14 26.0	12.174	23	12 0 2.69	1.8478	N. 4 46 30.8	13.583
SUNDAY 10.					TUESDAY 12.				
0	10 28 35.93	2.0718	N. 15 2 13.8	12.231	0	12 1 53.47	1.8449	N. 4 32 55.6	13.589
1	10 30 40.04	2.0653	14 49 58.3	12.285	1	12 3 44.08	1.8421	4 19 20.1	13.593
2	10 32 43.77	2.0589	14 37 39.6	12.338	2	12 5 34.52	1.8393	4 5 44.4	13.598
3	10 34 47.11	2.0526	14 25 17.7	12.391	3	12 7 24.80	1.8367	3 52 8.4	13.602
4	10 36 50.08	2.0463	14 12 52.7	12.443	4	12 9 14.92	1.8341	3 38 32.2	13.604
5	10 38 52.67	2.0401	14 0 24.6	12.493	5	12 11 4.89	1.8316	3 24 55.9	13.606
6	10 40 54.89	2.0340	13 47 53.6	12.541	6	12 12 54.71	1.8292	3 11 19.5	13.607
7	10 42 56.75	2.0280	13 35 19.7	12.588	7	12 14 44.39	1.8268	2 57 43.1	13.607
8	10 44 58.25	2.0220	13 22 43.1	12.633	8	12 16 33.93	1.8245	2 44 6.7	13.606
9	10 46 59.39	2.0161	13 10 3.7	12.679	9	12 18 23.33	1.8223	2 30 30.4	13.605
10	10 49 0.18	2.0102	12 57 21.6	12.723	10	12 20 12.61	1.8203	2 16 54.1	13.603
11	10 51 0.62	2.0044	12 44 37.0	12.765	11	12 22 1.76	1.8183	2 3 18.0	13.600
12	10 53 0.71	1.9988	12 31 49.8	12.807	12	12 23 50.80	1.8163	1 49 42.1	13.597
13	10 55 0.47	1.9932	12 19 0.2	12.846	13	12 25 39.72	1.8144	1 36 6.4	13.593
14	10 56 59.89	1.9876	12 6 8.3	12.884	14	12 27 28.53	1.8127	1 22 31.0	13.588
15	10 58 58.98	1.9821	11 53 14.1	12.922	15	12 29 17.24	1.8109	1 8 55.9	13.582
16	11 0 57.74	1.9767	11 40 17.7	12.958	16	12 31 5.84	1.8093	0 55 21.2	13.575
17	11 2 56.18	1.9713	11 27 19.1	12.994	17	12 32 54.35	1.8078	0 41 46.9	13.568
18	11 4 54.30	1.9661	11 14 18.4	13.028	18	12 34 42.77	1.8063	0 28 13.0	13.561
19	11 6 52.11	1.9609	11 1 15.7	13.061	19	12 36 31.10	1.8048	0 14 39.6	13.552
20	11 8 49.61	1.9558	10 48 11.1	13.093	20	12 38 19.35	1.8035	N. 0 1 6.8	13.543
21	11 10 46.81	1.9508	10 35 4.6	13.124	21	12 40 7.52	1.8023	S. 0 12 25.5	13.533
22	11 12 43.71	1.9459	10 21 56.2	13.154	22	12 41 55.62	1.8011	0 25 57.2	13.523
23	11 14 40.32	1.9410	10 8 46.1	13.183	23	12 43 43.65	1.8000	0 39 28.3	13.512
24	11 16 36.63	1.9362	N. 9 55 34.3	13.210	24	12 45 31.62	1.7990	S. 0 52 58.6	13.499

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 13.					FRIDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	12 45 31.62	1.7990	S. 0 52 58.6	13.499	0	14 12 6.16	1.8357	S. 11 14 56.7	12.168
1	12 47 19.53	1.7980	1 6 28.2	13.487	1	14 13 56.37	1.8381	11 27 5.5	12.124
2	12 49 7.38	1.7971	1 19 57.0	13.473	2	14 15 46.73	1.8406	11 39 11.6	12.080
3	12 50 55.18	1.7963	1 33 25.0	13.460	3	14 17 37.24	1.8432	11 51 15.1	12.035
4	12 52 42.94	1.7957	1 46 52.2	13.446	4	14 19 27.91	1.8458	12 3 15.8	11.989
5	12 54 30.66	1.7950	2 0 18.5	13.430	5	14 21 18.74	1.8486	12 15 13.8	11.943
6	12 56 18.34	1.7944	2 13 43.8	13.414	6	14 23 9.74	1.8513	12 27 9.0	11.896
7	12 58 5.99	1.7939	2 27 8.2	13.398	7	14 25 0.90	1.8541	12 39 1.3	11.848
8	12 59 53.61	1.7935	2 40 31.6	13.381	8	14 26 52.23	1.8570	12 50 50.7	11.798
9	13 1 41.21	1.7932	2 53 53.9	13.363	9	14 28 43.74	1.8599	13 2 37.1	11.749
10	13 3 28.79	1.7928	3 7 15.1	13.344	10	14 30 35.42	1.8629	13 14 20.6	11.700
11	13 5 16.35	1.7927	3 20 35.2	13.325	11	14 32 27.29	1.8660	13 26 1.1	11.649
12	13 7 3.91	1.7926	3 33 54.1	13.305	12	14 34 19.34	1.8691	13 37 38.5	11.598
13	13 8 51.46	1.7925	3 47 11.8	13.285	13	14 36 11.58	1.8723	13 49 12.8	11.545
14	13 10 39.01	1.7926	4 0 28.3	13.264	14	14 38 4.01	1.8755	14 0 43.9	11.492
15	13 12 26.57	1.7927	4 13 43.5	13.243	15	14 39 56.64	1.8788	14 12 11.8	11.438
16	13 14 14.13	1.7928	4 26 57.4	13.220	16	14 41 49.47	1.8822	14 23 36.5	11.384
17	13 16 1.71	1.7931	4 40 9.9	13.198	17	14 43 42.50	1.8856	14 34 57.9	11.328
18	13 17 49.30	1.7934	4 53 21.1	13.174	18	14 45 35.74	1.8891	14 46 15.9	11.273
19	13 19 36.92	1.7938	5 6 30.8	13.149	19	14 47 29.19	1.8926	14 57 30.6	11.216
20	13 21 24.56	1.7943	5 19 39.0	13.125	20	14 49 22.85	1.8962	15 8 41.8	11.158
21	13 23 12.23	1.7948	5 32 45.8	13.100	21	14 51 16.73	1.8998	15 19 49.6	11.100
22	13 24 59.94	1.7954	5 45 51.0	13.073	22	14 53 10.83	1.9035	15 30 53.8	11.041
23	13 26 47.68	1.7961	S. 5 58 54.6	13.046	23	14 55 5.15	1.9073	S. 15 41 54.5	10.981
THURSDAY 14.					SATURDAY 16.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	13 28 35.47	1.7969	S. 6 11 56.5	13.018	0	14 56 59.70	1.9110	S. 15 52 51.5	10.920
1	13 30 23.31	1.7977	6 24 56.8	12.991	1	14 58 54.47	1.9148	16 3 44.9	10.859
2	13 32 11.19	1.7985	6 37 55.4	12.962	2	15 0 49.48	1.9188	16 14 34.6	10.797
3	13 33 59.13	1.7995	6 50 52.3	12.933	3	15 2 44.72	1.9227	16 25 20.5	10.733
4	13 35 47.13	1.8006	7 3 47.4	12.903	4	15 4 40.20	1.9267	16 36 2.6	10.670
5	13 37 35.20	1.8017	7 16 40.6	12.872	5	15 6 35.92	1.9307	16 46 40.9	10.606
6	13 39 23.33	1.8028	7 29 32.0	12.842	6	15 8 31.88	1.9348	16 57 15.3	10.540
7	13 41 11.54	1.8041	7 42 21.6	12.810	7	15 10 28.09	1.9389	17 7 45.7	10.473
8	13 42 59.82	1.8054	7 55 9.2	12.778	8	15 12 24.55	1.9431	17 18 12.1	10.407
9	13 44 48.19	1.8068	8 7 54.9	12.744	9	15 14 21.26	1.9473	17 28 34.5	10.339
10	13 46 36.64	1.8083	8 20 38.5	12.710	10	15 16 18.23	1.9517	17 38 52.8	10.270
11	13 48 25.18	1.8098	8 33 20.1	12.676	11	15 18 15.46	1.9559	17 49 6.9	10.200
12	13 50 13.81	1.8113	8 45 59.6	12.641	12	15 20 12.94	1.9602	17 59 16.8	10.130
13	13 52 2.54	1.8130	8 58 37.0	12.605	13	15 22 10.68	1.9646	18 9 22.5	10.058
14	13 53 51.37	1.8148	9 11 12.2	12.568	14	15 24 8.69	1.9691	18 19 23.8	9.986
15	13 55 40.31	1.8166	9 23 45.2	12.532	15	15 26 6.97	1.9735	18 29 20.8	9.913
16	13 57 29.36	1.8184	9 36 16.0	12.494	16	15 28 5.51	1.9780	18 39 13.4	9.840
17	13 59 18.52	1.8203	9 48 44.5	12.455	17	15 30 4.33	1.9826	18 49 1.6	9.765
18	14 1 7.80	1.8223	10 1 10.6	12.416	18	15 32 3.42	1.9872	18 58 45.2	9.689
19	14 2 57.20	1.8244	10 13 34.4	12.377	19	15 34 2.79	1.9917	19 8 24.3	9.613
20	14 4 46.73	1.8265	10 25 55.8	12.337	20	15 36 2.43	1.9963	19 17 58.7	9.535
21	14 6 36.38	1.8287	10 38 14.8	12.296	21	15 38 2.35	2.0011	19 27 28.5	9.457
22	14 8 26.17	1.8309	10 50 31.3	12.254	22	15 40 2.56	2.0058	19 36 53.5	9.378
23	14 10 16.09	1.8333	11 2 45.3	12.212	23	15 42 3.05	2.0106	19 46 13.8	9.298
24	14 12 6.16	1.8357	S. 11 14 56.7	12.168	24	15 44 3.83	2.0153	S. 19 55 29.2	9.217

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 17.					TUESDAY 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 44 3.83	2.0153	S. 19 55 29.2	9.217	0	17 26 31.34	2.2505	S. 25 26 57.2	4.236
1	15 46 4.89	2.0202	20 4 39.8	9.135	1	17 28 46.50	2.2549	25 31 7.6	4.109
2	15 48 6.25	2.0250	20 13 45.4	9.052	2	17 31 1.93	2.2592	25 35 10.3	3.982
3	15 50 7.89	2.0298	20 22 46.0	8.968	3	17 33 17.61	2.2634	25 39 5.4	3.854
4	15 52 9.82	2.0347	20 31 41.6	8.884	4	17 35 33.54	2.2676	25 42 52.8	3.726
5	15 54 12.05	2.0396	20 40 32.1	8.798	5	17 37 49.72	2.2717	25 46 32.5	3.597
6	15 56 14.57	2.0445	20 49 17.4	8.712	6	17 40 6.14	2.2757	25 50 4.4	3.467
7	15 58 17.39	2.0495	20 57 57.5	8.625	7	17 42 22.80	2.2798	25 53 28.5	3.336
8	16 0 20.51	2.0544	21 6 32.4	8.537	8	17 44 39.71	2.2838	25 56 44.7	3.204
9	16 2 23.92	2.0594	21 15 1.9	8.447	9	17 46 56.85	2.2876	25 59 53.0	3.072
10	16 4 27.64	2.0644	21 23 26.0	8.357	10	17 49 14.22	2.2913	26 2 53.3	2.938
11	16 6 31.65	2.0694	21 31 44.7	8.266	11	17 51 31.81	2.2950	26 5 45.6	2.804
12	16 8 35.97	2.0745	21 39 57.9	8.174	12	17 53 49.62	2.2987	26 8 29.8	2.669
13	16 10 40.59	2.0795	21 48 5.6	8.081	13	17 56 7.65	2.3023	26 11 5.9	2.534
14	16 12 45.51	2.0846	21 56 7.6	7.987	14	17 58 25.89	2.3058	26 13 33.9	2.398
15	16 14 50.74	2.0897	22 4 4.0	7.893	15	18 0 44.34	2.3093	26 15 53.7	2.262
16	16 16 56.27	2.0947	22 11 54.7	7.797	16	18 3 3.00	2.3126	26 18 5.3	2.124
17	16 19 2.10	2.0998	22 19 39.6	7.700	17	18 5 21.85	2.3158	26 20 8.6	1.987
18	16 21 8.24	2.1048	22 27 18.7	7.602	18	18 7 40.90	2.3190	26 22 3.7	1.848
19	16 23 14.68	2.1099	22 34 51.9	7.503	19	18 10 0.13	2.3221	26 23 50.4	1.709
20	16 25 21.43	2.1150	22 42 19.1	7.403	20	18 12 19.55	2.3252	26 25 28.8	1.569
21	16 27 28.48	2.1201	22 49 40.3	7.303	21	18 14 39.15	2.3281	26 26 58.7	1.428
22	16 29 35.84	2.1252	22 56 55.5	7.202	22	18 16 58.92	2.3309	26 28 20.2	1.288
23	16 31 43.50	2.1303	S. 23 4 4.5	7.099	23	18 19 18.86	2.3337	S. 26 29 33.3	1.147
MONDAY 18.					WEDNESDAY 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 33 51.47	2.1353	S. 23 11 7.4	6.997	0	18 21 38.97	2.3364	S. 26 30 37.8	1.004
1	16 35 59.74	2.1403	23 18 4.1	6.892	1	18 23 59.23	2.3390	26 31 33.8	0.862
2	16 38 8.31	2.1454	23 24 54.4	6.786	2	18 26 19.65	2.3415	26 32 21.2	0.718
3	16 40 17.19	2.1505	23 31 38.4	6.680	3	18 28 40.21	2.3439	26 33 0.0	0.575
4	16 42 26.37	2.1555	23 38 16.0	6.573	4	18 31 0.92	2.3463	26 33 30.2	0.432
5	16 44 35.85	2.1605	23 44 47.2	6.465	5	18 33 21.76	2.3485	26 33 51.8	0.288
6	16 46 45.63	2.1655	23 51 11.8	6.356	6	18 35 42.74	2.3507	26 34 4.7	-0.143
7	16 48 55.71	2.1705	23 57 29.9	6.246	7	18 38 3.84	2.3527	26 34 8.9	+0.003
8	16 51 6.09	2.1755	24 3 41.3	6.134	8	18 40 25.06	2.3546	26 34 4.4	0.148
9	16 53 16.77	2.1804	24 9 46.0	6.023	9	18 42 46.39	2.3564	26 33 51.2	0.293
10	16 55 27.74	2.1853	24 15 44.0	5.910	10	18 45 7.83	2.3582	26 33 29.2	0.440
11	16 57 39.00	2.1902	24 21 35.2	5.796	11	18 47 29.37	2.3598	26 32 58.4	0.587
12	16 59 50.56	2.1951	24 27 19.5	5.681	12	18 49 51.01	2.3614	26 32 18.8	0.733
13	17 2 2.41	2.1999	24 32 56.9	5.566	13	18 52 12.74	2.3628	26 31 30.4	0.880
14	17 4 14.55	2.2047	24 38 27.4	5.449	14	18 54 34.55	2.3642	26 30 33.2	1.028
15	17 6 26.97	2.2094	24 43 50.8	5.332	15	18 56 56.44	2.3655	26 29 27.1	1.175
16	17 8 39.68	2.2142	24 49 7.2	5.214	16	18 59 18.41	2.3667	26 28 12.2	1.323
17	17 10 52.67	2.2189	24 54 16.5	5.095	17	19 1 40.45	2.3677	26 26 48.4	1.471
18	17 13 5.95	2.2236	24 59 18.6	4.974	18	19 4 2.54	2.3686	26 25 15.7	1.619
19	17 15 19.50	2.2282	25 4 13.4	4.853	19	19 6 24.68	2.3695	26 23 34.1	1.767
20	17 17 33.33	2.2328	25 9 0.9	4.731	20	19 8 46.87	2.3703	26 21 43.7	1.914
21	17 19 47.43	2.2373	25 13 41.1	4.608	21	19 11 9.11	2.3709	26 19 44.4	2.063
22	17 22 1.80	2.2418	25 18 13.9	4.485	22	19 13 31.39	2.3715	26 17 36.2	2.212
23	17 24 16.44	2.2462	25 22 39.3	4.361	23	19 15 53.69	2.3719	26 15 19.0	2.360
24	17 26 31.34	2.2505	S. 25 26 57.2	4.236	24	19 18 16.02	2.3723	S. 26 12 53.0	2.508



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 21.					SATURDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	19 18 16.02	2.3723	S. 26 12 53.0	2.508	0	21 10 50.59	2.2900	S. 21 26 22.6	9.228
1	19 20 38.37	2.3726	26 10 18.0	2.657	1	21 13 7.89	2.2868	21 17 5.2	9.352
2	19 23 0.73	2.3727	26 7 34.2	2.805	2	21 15 25.00	2.2836	21 7 40.4	9.474
3	19 25 23.09	2.3728	26 4 41.4	2.954	3	21 17 41.92	2.2803	20 58 8.3	9.596
4	19 27 45.46	2.3728	26 1 39.7	3.103	4	21 19 58.64	2.2771	20 48 28.9	9.717
5	19 30 7.82	2.3726	25 58 29.1	3.251	5	21 22 15.17	2.2738	20 38 42.3	9.836
6	19 32 30.17	2.3723	25 55 9.6	3.398	6	21 24 31.50	2.2705	20 28 48.6	9.954
7	19 34 52.50	2.3720	25 51 41.3	3.546	7	21 26 47.63	2.2672	20 18 47.8	10.072
8	19 37 14.81	2.3716	25 48 4.1	3.694	8	21 29 3.56	2.2638	20 8 40.0	10.188
9	19 39 37.09	2.3711	25 44 18.0	3.843	9	21 31 19.28	2.2604	19 58 25.2	10.304
10	19 41 59.34	2.3705	25 40 23.0	3.990	10	21 33 34.81	2.2571	19 48 3.5	10.418
11	19 44 21.55	2.3698	25 36 19.2	4.137	11	21 35 50.13	2.2537	19 37 35.0	10.531
12	19 46 43.71	2.3689	25 32 6.6	4.284	12	21 38 5.25	2.2503	19 26 59.8	10.643
13	19 49 5.82	2.3681	25 27 45.1	4.431	13	21 40 20.16	2.2468	19 16 17.9	10.754
14	19 51 27.88	2.3671	25 23 14.9	4.577	14	21 42 34.87	2.2434	19 5 29.3	10.864
15	19 53 49.88	2.3660	25 18 35.9	4.723	15	21 44 49.37	2.2400	18 54 34.2	10.973
16	19 56 11.81	2.3648	25 13 48.2	4.868	16	21 47 3.67	2.2366	18 43 32.6	11.081
17	19 58 33.66	2.3636	25 8 51.7	5.014	17	21 49 17.76	2.2332	18 32 24.5	11.188
18	20 0 55.43	2.3623	25 3 46.5	5.159	18	21 51 31.65	2.2298	18 21 10.1	11.293
19	20 3 17.13	2.3608	24 58 32.6	5.303	19	21 53 45.33	2.2263	18 9 49.4	11.397
20	20 5 38.74	2.3593	24 53 10.1	5.448	20	21 55 58.81	2.2229	17 58 22.5	11.500
21	20 8 0.25	2.3578	24 47 38.9	5.592	21	21 58 12.08	2.2195	17 46 49.4	11.603
22	20 10 21.66	2.3561	24 41 59.1	5.735	22	22 0 25.15	2.2161	17 35 10.2	11.704
23	20 12 42.97	2.3543	S. 24 36 10.7	5.878	23	22 2 38.02	2.2128	S. 17 23 24.9	11.804
FRIDAY 22.					SUNDAY 24.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	20 15 4.17	2.3526	S. 24 30 13.8	6.020	0	22 4 50.68	2.2093	S. 17 11 33.7	11.902
1	20 17 25.27	2.3506	24 24 8.3	6.162	1	22 7 3.14	2.2060	16 59 36.7	11.999
2	20 19 46.25	2.3486	24 17 54.4	6.302	2	22 9 15.40	2.2027	16 47 33.8	12.096
3	20 22 7.11	2.3465	24 11 32.1	6.443	3	22 11 27.46	2.1993	16 35 25.2	12.190
4	20 24 27.84	2.3445	24 5 1.3	6.583	4	22 13 39.32	2.1961	16 23 11.4	12.284
5	20 26 48.45	2.3423	23 58 22.2	6.722	5	22 15 50.99	2.1928	16 10 51.1	12.377
6	20 29 8.92	2.3401	23 51 34.7	6.861	6	22 18 2.46	2.1895	15 58 25.7	12.468
7	20 31 29.26	2.3378	23 44 38.9	6.999	7	22 20 13.73	2.1863	15 45 54.9	12.558
8	20 33 49.45	2.3353	23 37 34.8	7.136	8	22 22 24.81	2.1831	15 33 18.7	12.647
9	20 36 9.50	2.3329	23 30 22.6	7.273	9	22 24 35.70	2.1799	15 20 37.2	12.735
10	20 38 29.40	2.3304	23 23 2.1	7.409	10	22 26 46.40	2.1768	15 7 50.5	12.822
11	20 40 49.15	2.3278	23 15 33.5	7.544	11	22 28 56.91	2.1737	14 54 58.6	12.907
12	20 43 8.74	2.3252	23 7 56.8	7.679	12	22 31 7.24	2.1706	14 42 1.7	12.991
13	20 45 28.17	2.3225	23 0 12.0	7.813	13	22 33 17.38	2.1675	14 28 59.7	13.074
14	20 47 47.44	2.3198	22 52 19.3	7.945	14	22 35 27.34	2.1645	14 15 52.8	13.155
15	20 50 6.54	2.3170	22 44 18.6	8.078	15	22 37 37.12	2.1613	14 2 41.1	13.235
16	20 52 25.48	2.3142	22 36 10.0	8.209	16	22 39 46.72	2.1585	13 49 24.6	13.314
17	20 54 44.25	2.3113	22 27 53.5	8.340	17	22 41 56.14	2.1556	13 36 3.4	13.392
18	20 57 2.84	2.3083	22 19 29.2	8.469	18	22 44 5.39	2.1528	13 22 37.5	13.469
19	20 59 21.25	2.3054	22 10 57.2	8.598	19	22 46 14.47	2.1499	13 9 7.1	13.544
20	21 1 39.49	2.3024	22 2 17.5	8.726	20	22 48 23.38	2.1471	12 55 32.2	13.618
21	21 3 57.54	2.2993	21 53 30.1	8.853	21	22 50 32.12	2.1443	12 41 52.9	13.691
22	21 6 15.41	2.2963	21 44 35.1	8.979	22	22 52 40.70	2.1417	12 28 9.3	13.763
23	21 8 33.09	2.2932	21 35 32.6	9.104	23	22 54 49.12	2.1391	12 14 21.4	13.833
24	21 10 50.59	2.2900	S. 21 26 22.6	9.228	24	22 56 57.39	2.1365	S. 12 0 29.3	13.902

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 25.					WEDNESDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	22 56 57.39	2.1365	S. 12 0 29.3	13.901	0	0 37 38.62	2.0854	N. 0 1 33.0	15.679
1	22 59 5.50	2.1339	11 46 33.2	13.969	1	0 39 43.77	2.0862	0 17 13.9	15.683
2	23 1 13.46	2.1314	11 32 33.0	14.036	2	0 41 48.96	2.0869	0 32 55.0	15.687
3	23 3 21.27	2.1289	11 18 28.9	14.101	3	0 43 54.20	2.0878	0 48 36.3	15.689
4	23 5 28.93	2.1265	11 4 20.9	14.165	4	0 45 59.50	2.0888	1 4 17.7	15.689
5	23 7 36.45	2.1242	10 50 9.1	14.227	5	0 48 4.86	2.0898	1 19 59.0	15.688
6	23 9 43.83	2.1219	10 35 53.6	14.288	6	0 50 10.28	2.0910	1 35 40.2	15.686
7	23 11 51.08	2.1197	10 21 34.5	14.348	7	0 52 15.78	2.0923	1 51 21.3	15.683
8	23 13 58.19	2.1174	10 7 11.9	14.406	8	0 54 21.35	2.0935	2 7 2.2	15.678
9	23 16 5.17	2.1153	9 52 45.8	14.464	9	0 56 27.00	2.0949	2 22 42.7	15.671
10	23 18 12.03	2.1133	9 38 16.2	14.521	10	0 58 32.74	2.0964	2 38 22.7	15.663
11	23 20 18.76	2.1113	9 23 43.3	14.575	11	1 0 38.57	2.0980	2 54 2.2	15.654
12	23 22 25.38	2.1093	9 9 7.2	14.628	12	1 2 44.50	2.0997	3 9 41.2	15.644
13	23 24 31.88	2.1074	8 54 27.9	14.680	13	1 4 50.53	2.1013	3 25 19.5	15.632
14	23 26 38.27	2.1057	8 39 45.6	14.731	14	1 6 56.66	2.1031	3 40 57.0	15.618
15	23 28 44.56	2.1039	8 25 0.2	14.781	15	1 9 2.90	2.1050	3 56 33.7	15.604
16	23 30 50.74	2.1022	8 10 11.9	14.829	16	1 11 9.26	2.1070	4 12 9.5	15.588
17	23 32 56.82	2.1006	7 55 20.7	14.876	17	1 13 15.74	2.1090	4 27 44.3	15.571
18	23 35 2.81	2.0990	7 40 26.8	14.921	18	1 15 22.34	2.1111	4 43 18.0	15.552
19	23 37 8.70	2.0974	7 25 30.2	14.966	19	1 17 29.07	2.1133	4 58 50.5	15.532
20	23 39 14.50	2.0960	7 10 30.9	15.009	20	1 19 35.93	2.1155	5 14 21.8	15.510
21	23 41 20.22	2.0947	6 55 29.1	15.051	21	1 21 42.93	2.1179	5 29 51.7	15.487
22	23 43 25.86	2.0934	6 40 24.8	15.092	22	1 23 50.08	2.1204	5 45 20.2	15.463
23	23 45 31.43	2.0922	S. 6 25 18.1	15.131	23	1 25 57.38	2.1229	N. 6 0 47.2	15.437
TUESDAY 26.					THURSDAY 28.				
0	23 47 36.92	2.0910	S. 6 10 9.1	15.168	0	1 28 4.83	2.1255	N. 6 16 12.6	15.409
1	23 49 42.35	2.0899	5 54 57.9	15.205	1	1 30 12.44	2.1282	6 31 36.3	15.380
2	23 51 47.71	2.0888	5 39 44.5	15.240	2	1 32 20.21	2.1309	6 46 58.2	15.350
3	23 53 53.01	2.0879	5 24 29.1	15.273	3	1 34 28.15	2.1338	7 2 18.3	15.319
4	23 55 58.26	2.0871	5 9 11.7	15.306	4	1 36 36.26	2.1367	7 17 36.5	15.286
5	23 58 3.46	2.0863	4 53 52.4	15.338	5	1 38 44.55	2.1397	7 32 52.6	15.251
6	0 0 8.61	2.0855	4 38 31.2	15.368	6	1 40 53.02	2.1428	7 48 6.6	15.215
7	0 2 13.72	2.0848	4 23 8.3	15.396	7	1 43 1.68	2.1459	8 3 18.4	15.178
8	0 4 18.79	2.0843	4 7 43.7	15.423	8	1 45 10.53	2.1492	8 18 27.9	15.139
9	0 6 23.83	2.0838	3 52 17.5	15.449	9	1 47 19.58	2.1525	8 33 35.1	15.099
10	0 8 28.84	2.0833	3 36 49.8	15.474	10	1 49 28.83	2.1558	8 48 39.8	15.057
11	0 10 33.83	2.0830	3 21 20.6	15.498	11	1 51 38.28	2.1593	9 3 41.9	15.013
12	0 12 38.80	2.0828	3 5 50.1	15.519	12	1 53 47.94	2.1628	9 18 41.4	14.969
13	0 14 43.76	2.0825	2 50 18.3	15.540	13	1 55 57.81	2.1663	9 33 38.2	14.923
14	0 16 48.70	2.0823	2 34 45.3	15.559	14	1 58 7.90	2.1701	9 48 32.1	14.874
15	0 18 53.64	2.0823	2 19 11.2	15.577	15	2 0 18.22	2.1738	10 3 23.1	14.825
16	0 20 58.58	2.0823	2 3 36.1	15.593	16	2 2 28.76	2.1776	10 18 11.1	14.774
17	0 23 3.52	2.0824	1 48 0.0	15.609	17	2 4 39.53	2.1815	10 32 56.0	14.722
18	0 25 8.47	2.0827	1 32 23.0	15.623	18	2 6 50.54	2.1855	10 47 37.7	14.668
19	0 27 13.44	2.0829	1 16 45.2	15.636	19	2 9 1.79	2.1895	11 2 16.2	14.613
20	0 29 18.42	2.0832	1 1 6.7	15.648	20	2 11 13.28	2.1937	11 16 51.3	14.556
21	0 31 23.42	2.0836	0 45 27.5	15.658	21	2 13 25.03	2.1978	11 31 22.9	14.498
22	0 33 28.45	2.0842	0 29 47.8	15.666	22	2 15 37.02	2.2020	11 45 51.0	14.438
23	0 35 33.52	2.0848	S. 0 14 7.6	15.673	23	2 17 49.27	2.2063	12 0 15.5	14.377
24	0 37 38.62	2.0854	N. 0 1 33.0	15.679	24	2 20 1.78	2.2107	N. 12 14 36.3	14.314

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 29.					SUNDAY 31.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 20 1.78	2.2107	N.12 14 36.3	14.314	0	4 12 3.64	2.4661	N.21 59 21.2	9.446
1	2 22 14.55	2.2151	12 28 53.2	14.249	1	4 14 31.77	2.4715	22 8 43.8	9.307
2	2 24 27.59	2.2196	12 43 6.2	14.183	2	4 17 0.22	2.4768	22 17 58.0	9.166
3	2 26 40.90	2.2242	12 57 15.2	14.116	3	4 19 28.99	2.4821	22 27 3.7	9.023
4	2 28 54.49	2.2288	13 11 20.1	14.047	4	4 21 58.07	2.4873	22 36 0.8	8.879
5	2 31 8.36	2.2335	13 25 20.8	13.976	5	4 24 27.47	2.4926	22 44 49.2	8.734
6	2 33 22.51	2.2383	13 39 17.2	13.904	6	4 26 57.18	2.4978	22 53 28.9	8.588
7	2 35 36.95	2.2430	13 53 9.3	13.831	7	4 29 27.20	2.5028	23 1 59.8	8.440
8	2 37 51.67	2.2478	14 6 56.9	13.755	8	4 31 57.52	2.5079	23 10 21.7	8.291
9	2 40 6.69	2.2528	14 20 39.9	13.678	9	4 34 28.15	2.5129	23 18 34.7	8.141
10	2 42 22.00	2.2578	14 34 18.2	13.599	10	4 36 59.07	2.5178	23 26 38.6	7.989
11	2 44 37.62	2.2628	14 47 51.8	13.519	11	4 39 30.28	2.5226	23 34 33.4	7.837
12	2 46 53.53	2.2678	15 1 20.5	13.438	12	4 42 1.78	2.5274	23 42 19.0	7.683
13	2 49 9.75	2.2728	15 14 44.3	13.354	13	4 44 33.57	2.5321	23 49 55.3	7.527
14	2 51 26.27	2.2779	15 28 3.0	13.269	14	4 47 5.63	2.5367	23 57 22.2	7.370
15	2 53 43.10	2.2832	15 41 16.6	13.183	15	4 49 37.97	2.5412	24 4 39.7	7.212
16	2 56 0.25	2.2884	15 54 25.0	13.096	16	4 52 10.57	2.5456	24 11 47.6	7.053
17	2 58 17.71	2.2937	16 7 28.1	13.006	17	4 54 43.44	2.5499	24 18 46.0	6.893
18	3 0 35.49	2.2990	16 20 25.7	12.914	18	4 57 16.56	2.5542	24 25 34.7	6.731
19	3 2 53.59	2.3044	16 33 17.8	12.822	19	4 59 49.94	2.5584	24 32 13.7	6.568
20	3 5 12.02	2.3098	16 46 4.3	12.728	20	5 2 23.57	2.5624	24 38 42.9	6.405
21	3 7 30.77	2.3153	16 58 45.1	12.632	21	5 4 57.43	2.5663	24 45 2.3	6.241
22	3 9 49.85	2.3207	17 11 20.1	12.534	22	5 7 31.53	2.5702	24 51 11.8	6.075
23	3 12 9.25	2.3261	N.17 23 49.2	12.435	23	5 10 5.85	2.5739	N.24 57 11.3	5.904
SATURDAY 30.					MONDAY, AUGUST 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	3 14 28.98	2.3316	N.17 36 12.3	12.334	0	5 12 40.40	2.5777	N.25 3 0.8	5.741
1	3 16 49.04	2.3372	17 48 29.3	12.232					
2	3 19 9.44	2.3428	18 0 40.1	12.128					
3	3 21 30.18	2.3484	18 12 44.6	12.022					
4	3 23 51.25	2.3540	18 24 42.7	11.915					
5	3 26 12.66	2.3596	18 36 34.4	11.807					
6	3 28 34.40	2.3652	18 48 19.5	11.697					
7	3 30 56.48	2.3708	18 59 58.0	11.585					
8	3 33 18.90	2.3765	19 11 29.7	11.471					
9	3 35 41.66	2.3822	19 22 54.5	11.356					
10	3 38 4.76	2.3878	19 34 12.4	11.240					
11	3 40 28.20	2.3935	19 45 23.3	11.122					
12	3 42 51.98	2.3992	19 56 27.0	11.002					
13	3 45 16.10	2.4048	20 7 23.5	10.881					
14	3 47 40.56	2.4105	20 18 12.7	10.758					
15	3 50 5.36	2.4162	20 28 54.4	10.633					
16	3 52 30.50	2.4218	20 39 28.6	10.508					
17	3 54 55.97	2.4273	20 49 55.3	10.380					
18	3 57 21.78	2.4330	21 0 14.2	10.250					
19	3 59 47.93	2.4386	21 10 25.3	10.120					
20	4 2 14.41	2.4441	21 20 28.6	9.988					
21	4 4 41.22	2.4497	21 30 23.9	9.855					
22	4 7 8.37	2.4552	21 40 11.2	9.720					
23	4 9 35.84	2.4606	21 49 50.3	9.583					
24	4 12 3.64	2.4661	N.21 59 21.2	9.446					

## PHASES OF THE MOON.

	d	h	m
● New Moon . . . . .	July 6	9	20.0
☾ First Quarter . . . . .	13	20	24.4
○ Full Moon . . . . .	21	20	37.0
☾ Last Quarter . . . . .	28	21	34.5

	d	h
☾ Perigee . . . . .	July 3	15.1
☾ Apogee . . . . .	15	12.0
☾ Perigee . . . . .	30	10.4

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	<i>α</i> Aquilæ	W.	87 21 48	3060	88 50 46	3052	90 19 54	3045	91 49 11	3040
	Fomalhaut	W.	55 1 39	2504	56 42 46	2487	58 24 17	2471	60 6 11	2455
	Aldebaran	E.	42 32 35	2313	40 46 55	2311	39 1 12	2309	37 15 26	2308
	SUN	E.	72 48 36	2560	71 8 46	2552	69 28 45	2544	67 48 33	2537
2	<i>α</i> Aquilæ	W.	99 16 39	3036	100 46 7	3041	102 15 29	3047	103 44 44	3055
	Fomalhaut	W.	68 40 44	2392	70 24 30	2382	72 8 30	2373	73 52 43	2365
	<i>α</i> Pegasi	W.	51 35 33	2866	53 8 35	2831	54 42 23	2798	56 16 54	2767
	SUN	E.	59 25 7	2504	57 43 59	2499	56 2 44	2494	54 21 22	2489
3	Fomalhaut	W.	82 36 28	2335	84 21 37	2331	86 6 51	2328	87 52 9	2326
	<i>α</i> Pegasi	W.	64 18 24	2653	65 56 7	2636	67 34 13	2621	69 12 39	2608
	SUN	E.	45 53 5	2473	44 11 13	2471	42 29 19	2470	40 47 24	2470
4	Fomalhaut	W.	96 39 6	2327	98 24 26	2330	100 9 41	2334	101 54 51	2338
	<i>α</i> Pegasi	W.	77 28 31	2568	79 8 11	2564	80 47 56	2560	82 27 46	2559
	SUN	E.	32 18 2	2480	30 36 20	2484	28 54 44	2489	27 13 16	2496
8	SUN	W.	21 36 10	2807	23 10 29	2816	24 44 37	2826	26 18 31	2838
	Spica	E.	76 18 48	2447	74 36 20	2462	72 54 13	2478	71 12 29	2494
	Antares	E.	122 12 48	2441	120 30 12	2455	118 47 56	2470	117 6 1	2486
9	SUN	W.	34 3 59	2906	35 36 10	2921	37 8 2	2937	38 39 34	2953
	Spica	E.	62 49 24	2575	61 9 55	2592	59 30 50	2609	57 52 7	2626
	Antares	E.	108 41 50	2564	107 2 5	2580	105 22 42	2596	103 43 41	2612
10	SUN	W.	46 12 11	3034	47 41 42	3050	49 10 53	3066	50 39 44	3082
	MARS	W.	20 19 44	2970	21 50 34	2979	23 21 13	2989	24 51 40	2999
	Spica	E.	49 44 17	2711	48 7 52	2729	46 31 51	2746	44 56 12	2763
	Antares	E.	95 34 1	2691	93 57 9	2707	92 20 38	2722	90 44 28	2738
11	SUN	W.	57 59 8	3160	59 26 5	3175	60 52 43	3190	62 19 4	3205
	MARS	W.	32 20 32	3057	33 49 34	3070	35 18 20	3083	36 46 50	3096
	Regulus	W.	18 4 44	2945	19 36 6	2941	21 7 33	2939	22 39 3	2939
	Spica	E.	37 3 36	2850	35 30 13	2869	33 57 14	2867	32 24 38	2905
	Antares	E.	82 48 39	2812	81 14 27	2827	79 40 34	2841	78 6 59	2854
12	SUN	W.	69 26 38	3272	70 51 22	3284	72 15 51	3296	73 40 7	3308
	MARS	W.	44 5 37	3156	45 32 39	3167	46 59 28	3178	48 26 4	3188
	Regulus	W.	30 15 41	2964	31 46 39	2970	33 17 29	2977	34 48 10	2985
	Antares	E.	70 23 19	2918	68 51 23	2930	67 19 42	2941	65 48 16	2952
	<i>α</i> Aquilæ	E.	114 58 28	3926	113 45 35	3916	112 32 31	3906	111 19 16	3896
13	SUN	W.	80 38 13	3360	82 1 15	3368	83 24 8	3377	84 46 51	3386
	MARS	W.	55 36 2	3236	57 1 28	3244	58 26 45	3252	59 51 53	3259
	Regulus	W.	42 19 15	3021	43 49 1	3027	45 18 40	3034	46 48 10	3040
	Antares	E.	58 14 20	3001	56 44 9	3010	55 14 9	3018	53 44 19	3026
	<i>α</i> Aquilæ	E.	105 11 3	3865	103 57 8	3862	102 43 10	3860	101 29 9	3858
14	SUN	W.	91 38 18	3418	93 0 14	3425	94 22 4	3427	95 43 50	3431
	MARS	W.	66 55 31	3290	68 19 54	3294	69 44 13	3298	71 8 27	3302
	Regulus	W.	54 14 0	3065	55 42 53	3069	57 11 41	3072	58 40 25	3075

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.			P. L. of Diff.	XV <sup>h</sup>			P. L. of Diff.	XVIII <sup>h</sup>			P. L. of Diff.	XXI <sup>h</sup>			P. L. of Diff.
			°	'	"		°	'	"		°	'	"		°	'	"	
1	<i>α</i> Aquilæ	W.	93	18	34	3036	94	48	3	3033	96	17	35	3032	97	47	8	3033
	Fomalhaut	W.	61	48	27	2441	63	31	3	2427	65	13	59	2415	66	57	13	2403
	Aldebaran	E.	35	29	38	2309	33	43	51	2311	31	58	7	2314	30	12	28	2318
	SUN	E.	66	8	11	2530	64	27	39	2523	62	46	57	2516	61	6	6	2510
2	<i>α</i> Aquilæ	W.	105	13	49	3066	106	42	40	3079	108	11	15	3094	109	39	31	3122
	Fomalhaut	W.	75	37	8	2357	77	21	44	2350	79	6	30	2344	80	51	25	2339
	<i>α</i> Pegasi	W.	57	52	5	2739	59	27	53	2714	61	4	14	2692	62	41	5	2671
	SUN	E.	52	39	53	2485	50	58	18	2481	49	16	38	2478	47	34	53	2475
3	Fomalhaut	W.	89	37	31	2325	91	22	55	2324	93	8	19	2324	94	53	43	2325
	<i>α</i> Pegasi	W.	70	51	23	2597	72	30	22	2587	74	9	35	2579	75	48	59	2573
	SUN	E.	39	5	28	2470	37	23	33	2471	35	41	40	2473	33	59	49	2476
4	Fomalhaut	W.	103	39	55	2344	105	24	51	2350	107	9	37	2357	108	54	13	2366
	<i>α</i> Pegasi	W.	84	7	37	2559	85	47	28	2561	87	27	18	2563	89	7	4	2566
	SUN	E.	25	31	58	2506	23	50	53	2517	22	10	4	2532	20	29	35	2549
8	SUN	W.	27	52	10	2850	29	25	33	2863	30	58	40	2877	32	31	29	2891
	Spica	E.	69	31	7	2510	67	50	7	2526	66	9	30	2543	64	29	16	2559
	Antares	E.	115	24	28	2501	113	43	16	2517	112	2	26	2532	110	21	57	2548
9	SUN	W.	40	10	46	2669	41	41	38	2685	43	12	9	3001	44	42	20	3018
	Spica	E.	56	13	47	2643	54	35	50	2660	52	58	16	2677	51	21	5	2694
	Antares	E.	102	5	2	2628	100	26	45	2643	98	48	49	2659	97	11	14	2675
10	SUN	W.	52	8	15	3098	53	36	27	3114	55	4	19	3129	56	31	53	3145
	MARS	W.	26	21	54	3009	27	51	55	3021	29	21	42	3033	30	51	14	3045
	Spica	E.	43	20	55	2780	41	46	1	2798	40	11	30	2815	38	37	22	2832
	Antares	E.	89	8	39	2753	87	33	10	2768	85	58	0	2783	84	23	10	2798
11	SUN	W.	63	45	7	3219	65	10	54	3233	66	36	24	3246	68	1	39	3259
	MARS	W.	38	15	5	3108	39	43	5	3120	41	10	50	3132	42	33	21	3144
	Regulus	W.	24	10	32	2942	25	41	58	2946	27	13	19	2951	28	44	34	2957
	Spica	E.	30	52	25	2924	29	20	36	2944	27	49	12	2964	26	18	14	2984
	Antares	E.	76	33	41	2867	75	0	41	2880	73	27	57	2893	71	55	30	2906
12	SUN	W.	75	4	9	3319	76	27	58	3330	77	51	35	3340	79	15	0	3350
	MARS	W.	49	52	28	3198	51	18	39	3208	52	44	38	3218	54	10	25	3227
	Regulus	W.	36	18	41	2993	37	49	3	3000	39	19	16	3007	40	49	20	3014
	Antares	E.	64	17	3	2963	62	46	4	2973	61	15	17	2983	59	44	43	2992
	<i>α</i> Aquilæ	E.	110	5	52	3888	108	52	20	3880	107	38	40	3874	106	24	54	3869
13	SUN	W.	86	9	24	3393	87	31	49	3400	88	54	6	3406	90	16	16	3412
	MARS	W.	61	16	52	3266	62	41	43	3273	64	6	26	3279	65	31	2	3285
	Regulus	W.	48	17	33	3046	49	46	49	3051	51	15	58	3056	52	45	2	3061
	Antares	E.	52	14	39	3033	50	45	8	3040	49	15	45	3047	47	46	31	3053
	<i>α</i> Aquilæ	E.	100	15	7	3857	99	1	4	3856	97	47	0	3856	96	32	56	3856
14	SUN	W.	97	5	31	3435	98	27	8	3438	99	48	42	3440	101	10	13	3442
	MARS	W.	72	32	36	3305	73	56	42	3308	75	20	44	3310	76	44	44	3311
	Regulus	W.	60	9	6	3078	61	37	43	3080	63	6	18	3081	64	34	50	3082

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
14	JUPITER W.	15 40 38	3143	17 7 55	3140	18 35 16	3138	20 2 40	3135
	Antares E.	46 17 24	3059	44 48 24	3064	43 19 31	3069	41 50 44	3074
	α Aquilæ E.	95 18 52	3857	94 4 48	3859	92 50 47	3861	91 36 49	3864
15	SUN W.	102 31 41	3444	103 53 8	3445	105 14 34	3446	106 35 59	3446
	MARS W.	78 8 43	3312	79 32 40	3313	80 56 36	3313	82 20 32	3314
	Regulus W.	66 3 21	3083	67 31 51	3083	69 0 21	3083	70 28 51	3083
	JUPITER W.	27 20 8	3130	28 47 41	3129	30 15 15	3128	31 42 51	3126
	Antares E.	34 28 6	3092	32 59 47	3095	31 31 32	3098	30 3 20	3101
	α Aquilæ E.	85 27 41	3882	84 14 3	3887	83 0 31	3893	81 47 4	3899
	Fomalhaut E.	116 42 10	3282	115 17 37	3276	113 52 58	3272	112 28 14	3268
16	SUN W.	113 23 13	3439	114 44 46	3436	116 6 21	3433	117 28 0	3429
	MARS W.	89 20 24	3306	90 44 29	3302	92 8 38	3299	93 32 51	3295
	Regulus W.	77 51 39	3074	79 20 20	3071	80 49 4	3068	82 17 53	3064
	JUPITER W.	39 1 23	3114	40 29 15	3111	41 57 11	3107	43 25 12	3103
	Spica W.	24 2 5	3152	25 29 12	3140	26 56 33	3129	28 24 8	3119
	α Aquilæ E.	75 41 31	3937	74 28 50	3917	73 16 18	3958	72 3 57	3970
	Fomalhaut E.	105 23 13	3243	103 57 55	3238	102 32 31	3233	101 7 2	3228
17	SUN W.	124 17 25	3406	125 39 35	3400	127 1 51	3394	128 24 14	3388
	MARS W.	100 35 12	3270	101 59 59	3264	103 24 53	3257	104 49 54	3250
	Regulus W.	89 43 18	3039	91 12 42	3034	92 42 13	3028	94 11 51	3021
	JUPITER W.	50 46 42	3077	52 15 20	3071	53 44 5	3064	55 12 58	3057
	Spica W.	35 45 5	3071	37 13 50	3062	38 42 46	3053	40 11 53	3043
	α Aquilæ E.	66 5 29	4047	64 54 35	4066	63 44 0	4087	62 33 45	4110
	Fomalhaut E.	93 57 51	3198	92 31 40	3192	91 5 22	3186	89 38 56	3179
	α Pegasi E.	112 33 9	3488	111 12 32	3474	109 51 39	3459	108 30 29	3445
18	MARS W.	111 57 11	3211	113 23 7	3202	114 49 13	3193	116 15 30	3184
	Regulus W.	101 42 17	2983	103 12 51	2975	104 43 35	2966	106 14 30	2958
	JUPITER W.	62 39 40	3018	64 9 30	3010	65 39 30	3001	67 9 42	2992
	Spica W.	47 40 22	2997	49 10 38	2987	50 41 7	2977	52 11 48	2967
	α Aquilæ E.	56 48 50	4263	55 41 22	4303	54 34 32	4346	53 28 22	4394
	Fomalhaut E.	82 24 42	3145	80 57 27	3138	79 30 3	3131	78 2 31	3124
	α Pegasi E.	101 40 41	3378	100 17 59	3365	98 55 2	3353	97 31 52	3341
19	JUPITER W.	74 43 35	2944	76 14 59	2934	77 46 35	2923	79 18 25	2912
	Spica W.	59 48 27	2916	61 20 26	2905	62 52 39	2894	64 25 6	2883
	Fomalhaut E.	70 42 48	3091	69 14 28	3085	67 46 0	3079	66 17 25	3074
	α Pegasi E.	90 32 42	3286	89 8 15	3276	87 43 36	3267	86 18 46	3258
20	JUPITER W.	87 0 57	2859	88 34 9	2848	90 7 35	2837	91 41 15	2826
	Spica W.	72 10 53	2827	73 44 46	2816	75 18 53	2805	76 53 15	2794
	Antares W.	26 18 44	2849	27 52 8	2835	29 25 51	2820	30 59 53	2806
	Fomalhaut E.	58 53 2	3054	57 23 56	3052	55 54 47	3051	54 25 37	3050
	α Pegasi E.	79 12 8	3220	77 46 22	3214	76 20 29	3208	74 54 29	3203
	SATURN E.	120 43 1	2828	119 9 9	2817	117 35 3	2805	116 0 42	2794
21	JUPITER W.	99 33 15	2770	101 8 22	2759	102 43 44	2748	104 19 20	2737
	Spica W.	84 48 46	2737	86 24 37	2726	88 0 42	2715	89 37 2	2704
	Antares W.	38 54 27	2741	40 30 12	2729	42 6 14	2717	43 42 32	2705

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
14	JUPITER	W.	21 30 7	3133	22 57 36	3132	24 25 5	3132	25 52 36	3131
	Antares	E.	40 22 3	3078	38 53 27	3082	37 24 55	3086	35 56 28	3089
	α Aquilæ	E.	90 22 53	3867	89 9 0	3870	87 55 10	3874	86 41 24	3878
15	SUN	W.	107 57 24	3446	109 18 49	3445	110 40 15	3443	112 1 43	3441
	MARS	W.	83 44 27	3313	85 8 24	3312	86 32 22	3310	87 56 22	3308
	Regulus	W.	71 57 21	3082	73 25 53	3081	74 54 26	3079	76 23 1	3077
	JUPITER	W.	33 10 28	3124	34 38 8	3122	36 5 50	3120	37 33 35	3117
	Antares	E.	28 35 12	3104	27 7 7	3107	25 39 6	3110	24 11 8	3113
	α Aquilæ	E.	80 33 43	3905	79 20 28	3913	78 7 21	3920	76 54 22	3928
	Fomalhaut	E.	111 3 25	3264	109 38 31	3259	108 13 31	3253	106 48 25	3248
16	SUN	W.	118 49 44	3425	120 11 32	3421	121 33 24	3416	122 55 22	3412
	MARS	W.	94 57 8	3291	96 21 30	3286	97 45 58	3281	99 10 32	3276
	Regulus	W.	83 46 47	3060	85 15 46	3056	86 44 50	3050	88 14 1	3045
	JUPITER	W.	44 53 18	3098	46 21 30	3093	47 49 47	3088	49 18 11	3082
	Spica	W.	29 51 55	3108	31 19 55	3098	32 48 7	3089	34 16 30	3080
	α Aquilæ	E.	70 51 48	3983	69 39 51	3997	68 28 8	4012	67 16 40	4029
	Fomalhaut	E.	99 41 26	3222	98 15 43	3216	96 49 53	3210	95 23 55	3204
17	SUN	W.	129 46 44	3381	131 9 22	3374	132 32 7	3367	133 55 1	3359
	MARS	W.	106 15 4	3243	107 40 22	3236	109 5 49	3228	110 31 25	3220
	Regulus	W.	95 41 38	3014	97 11 34	3006	98 41 39	2999	100 11 53	2991
	JUPITER	W.	56 42 0	3050	58 11 11	3043	59 40 31	3035	61 10 0	3026
	Spica	W.	41 41 12	3034	43 10 42	3025	44 40 24	3016	46 10 17	3006
	α Aquilæ	E.	61 23 53	4135	60 14 25	4163	59 5 24	4193	57 56 52	4226
	Fomalhaut	E.	88 12 21	3173	86 45 39	3165	85 18 48	3158	83 51 49	3152
	α Pegasi	E.	107 9 2	3431	105 47 20	3417	104 25 22	3403	103 3 9	3390
18	MARS	W.	117 41 57	3175	119 8 36	3166	120 35 25	3156	122 2 26	3146
	Regulus	W.	107 45 35	2949	109 16 52	2940	110 48 20	2931	112 20 0	2921
	JUPITER	W.	68 40 5	2982	70 10 40	2973	71 41 26	2964	73 12 24	2954
	Spica	W.	53 42 42	2957	55 13 49	2947	56 45 8	2936	58 16 41	2926
	α Aquilæ	E.	52 22 55	4147	51 18 16	4506	50 14 29	4570	49 11 38	4638
	Fomalhaut	E.	76 34 50	3118	75 7 2	3110	73 39 5	3104	72 11 0	3098
	α Pegasi	E.	96 8 28	3330	94 44 50	3319	93 21 0	3308	91 56 57	3297
19	JUPITER	W.	80 50 28	2901	82 22 45	2891	83 55 15	2880	85 27 59	2869
	Spica	W.	65 57 47	2872	67 30 42	2861	69 3 51	2849	70 37 15	2838
	Fomalhaut	E.	64 48 44	3069	63 19 56	3065	61 51 3	3061	60 22 5	3057
	α Pegasi	E.	84 53 46	3250	83 28 35	3242	82 3 15	3234	80 37 46	3227
20	JUPITER	W.	93 15 10	2815	94 49 19	2803	96 23 43	2792	97 58 22	2781
	Spica	W.	78 27 51	2782	80 2 43	2771	81 37 49	2760	83 13 10	2748
	Antares	W.	32 34 13	2792	34 8 51	2779	35 43 46	2766	37 18 58	2753
	Fomalhaut	E.	52 56 26	3051	51 27 16	3053	49 58 8	3056	48 29 4	3050
	α Pegasi	E.	73 28 23	3199	72 2 12	3196	70 35 58	3193	69 9 41	3192
	SATURN	E.	114 26 6	2783	112 51 16	2772	111 16 11	2761	109 40 51	2750
21	JUPITER	W.	105 55 11	2726	107 31 16	2716	109 7 35	2705	110 44 9	2694
	Spica	W.	91 13 36	2693	92 50 25	2683	94 27 28	2672	96 4 46	2661
	Antares	W.	45 19 5	2693	46 55 54	2681	48 32 59	2670	50 10 19	2659

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Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
21	Fomalhaut	E.	47 0 5	3066	45 31 14	3075	44 2 34	3087	42 34 8	3101
	α Pegasi	E.	67 43 22	3192	66 17 3	3193	64 50 44	3194	63 24 27	3197
	SATURN	E.	108 5 17	2738	106 29 27	2727	104 53 23	2716	103 17 4	2705
22	Spica	W.	97 42 18	2651	99 20 4	2640	100 58 4	2630	102 36 18	2620
	Antares	W.	51 47 54	2648	53 25 44	2637	55 3 49	2626	56 42 9	2615
	SATURN	E.	95 11 52	2651	93 34 6	2640	91 56 6	2630	90 17 52	2620
23	Antares	W.	64 57 22	2565	66 37 5	2555	68 17 2	2546	69 57 12	2537
	SATURN	E.	82 3 13	2570	80 23 37	2561	78 43 49	2552	77 3 47	2543
	Aldebaran	E.	114 4 38	2589	112 25 28	2579	110 46 4	2569	109 6 26	2559
24	Antares	W.	78 21 6	2494	80 2 28	2485	81 44 2	2477	83 25 47	2470
	SATURN	E.	68 40 36	2500	66 59 23	2492	65 17 58	2484	63 36 22	2477
	Aldebaran	E.	100 45 5	2515	99 4 12	2507	97 23 8	2499	95 41 52	2491
25	Antares	W.	91 57 7	2434	93 39 53	2428	95 22 48	2422	97 5 52	2415
	α Aquilæ	W.	51 39 1	3917	52 52 4	3842	54 6 23	3774	55 21 52	3711
	SATURN	E.	55 5 46	2441	53 23 9	2434	51 40 23	2427	49 57 27	2421
	Aldebaran	E.	87 12 58	2455	85 30 42	2449	83 48 17	2443	82 5 43	2437
26	Antares	W.	105 43 21	2387	107 27 15	2382	109 11 15	2377	110 55 24	2372
	α Aquilæ	W.	61 54 18	3466	63 15 20	3429	64 37 4	3393	65 59 29	3360
	SATURN	E.	41 20 39	2392	39 36 53	2387	37 53 0	2382	36 8 59	2376
	Aldebaran	E.	73 30 51	2410	71 47 30	2405	70 4 3	2401	68 20 30	2397
	SUN	E.	127 45 40	2710	126 9 14	2704	124 32 40	2698	122 55 58	2692
27	α Aquilæ	W.	73 0 1	3233	74 25 30	3213	75 51 24	3195	77 17 39	3179
	Fomalhaut	W.	39 6 58	2788	40 41 41	2754	42 17 9	2723	43 53 18	2695
	SATURN	E.	27 27 9	2354	25 42 28	2350	23 57 42	2346	22 12 50	2342
	Aldebaran	E.	59 41 18	2379	57 57 13	2377	56 13 5	2375	54 28 53	2373
	SUN	E.	114 50 29	2665	113 13 2	2660	111 35 28	2656	109 57 49	2651
28	α Aquilæ	W.	84 32 57	3124	86 0 37	3117	87 28 26	3112	88 56 21	3108
	Fomalhaut	W.	52 2 27	2589	53 41 37	2573	55 21 8	2559	57 0 59	2547
	Aldebaran	E.	45 47 21	2368	44 3 0	2369	42 18 39	2370	40 34 20	2372
	SUN	E.	101 48 2	2630	100 9 48	2627	98 31 30	2624	96 53 7	2621
29	α Aquilæ	W.	96 16 34	3110	97 44 32	3115	99 12 24	3121	100 40 8	3129
	Fomalhaut	W.	65 24 14	2496	67 5 33	2488	68 47 3	2481	70 28 42	2475
	SUN	E.	88 40 10	2606	87 1 23	2604	85 22 34	2602	83 43 42	2600
30	α Aquilæ	W.	107 55 44	3195	109 21 59	3214	110 47 51	3236	112 13 17	3261
	Fomalhaut	W.	78 58 55	2452	80 41 16	2450	82 23 40	2448	84 6 7	2446
	α Pegasi	W.	60 49 8	2792	62 23 46	2774	63 58 49	2758	65 34 12	2744
	SATURN	W.	14 50 57	2289	16 37 13	2287	18 23 31	2285	20 9 52	2284
	SUN	E.	75 28 45	2593	73 49 40	2592	72 10 35	2591	70 31 28	2591
31	Fomalhaut	W.	92 38 46	2445	94 21 17	2446	96 3 47	2448	97 46 14	2450
	α Pegasi	W.	73 35 12	2693	75 12 1	2687	76 48 58	2682	78 26 2	2678
	SATURN	W.	29 1 58	2282	30 48 24	2282	32 34 50	2283	34 21 15	2284
	SUN	E.	62 15 56	2594	60 36 52	2595	58 57 50	2597	57 18 50	2599



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## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
21	Fomalhaut	E.	41 5 59	3118	39 38 11	3138	38 10 47	3162	36 43 52	3190
	α Pegasi	E.	61 58 14	3202	60 32 6	3208	59 6 6	3215	57 40 15	3225
	SATURN	E.	101 40 31	2694	100 3 43	2683	98 26 41	2672	96 49 24	2661
22	Spica	W.	104 14 45	2610	105 53 26	2601	107 32 19	2591	109 11 26	2582
	Antares	W.	58 20 44	2604	59 59 33	2594	61 38 36	2584	63 17 52	2574
	SATURN	E.	88 39 23	2610	87 0 41	2600	85 21 45	2590	83 42 36	2580
23	Antares	W.	71 37 34	2528	73 18 9	2519	74 58 56	2510	76 39 55	2502
	SATURN	E.	75 23 33	2534	73 43 7	2525	72 2 28	2517	70 21 38	2508
	Aldebaran	E.	107 26 35	2550	105 46 31	2541	104 6 15	2532	102 25 46	2523
24	Antares	W.	85 7 42	2462	86 49 48	2455	88 32 4	2448	90 14 31	2441
	SATURN	E.	61 54 36	2469	60 12 39	2461	58 30 31	2454	56 48 13	2448
	Aldebaran	E.	94 0 26	2483	92 18 49	2476	90 37 2	2469	88 55 5	2462
25	Antares	W.	98 49 5	2409	100 32 27	2403	102 15 57	2398	103 59 35	2392
	α Aquilæ	W.	56 38 27	3654	57 56 3	3601	59 14 36	3553	60 34 2	3507
	SATURN	E.	48 14 22	2415	46 31 9	2409	44 47 47	2403	43 4 17	2398
	Aldebaran	E.	80 23 0	2431	78 40 9	2426	76 57 11	2420	75 14 5	2415
26	Antares	W.	112 39 39	2367	114 24 1	2363	116 8 29	2359	117 53 4	2355
	α Aquilæ	W.	67 22 32	3330	68 46 9	3302	70 10 18	3277	71 34 56	3251
	SATURN	E.	34 24 50	2371	32 40 34	2367	30 56 12	2363	29 11 44	2358
	Aldebaran	E.	66 36 50	2393	64 53 5	2389	63 9 14	2385	61 25 18	2382
	SUN	E.	121 19 7	2686	119 42 8	2681	118 5 3	2675	116 27 50	2670
27	α Aquilæ	W.	78 44 12	3165	80 11 3	3153	81 38 9	3142	83 5 28	3133
	Fomalhaut	W.	45 30 6	2669	47 7 28	2646	48 45 20	2626	50 23 40	2607
	SATURN	E.	20 27 52	2339	18 42 50	2336	16 57 43	2334	15 12 32	2332
	Aldebaran	E.	52 44 39	2371	51 0 22	2369	49 16 3	2368	47 31 42	2368
	SUN	E.	108 20 3	2647	106 42 11	2643	105 4 14	2638	103 26 11	2634
28	α Aquilæ	W.	90 24 21	3106	91 52 24	3105	93 20 28	3105	94 48 32	3106
	Fomalhaut	W.	58 41 7	2535	60 21 32	2524	62 2 12	2513	63 43 7	2504
	Aldebaran	E.	38 50 5	2375	37 5 54	2379	35 21 48	2384	33 37 49	2389
	SUN	E.	95 14 40	2618	93 36 9	2614	91 57 33	2611	90 18 53	2609
29	α Aquilæ	W.	102 7 43	3139	103 35 6	3150	105 2 15	3163	106 29 9	3178
	Fomalhaut	W.	72 10 30	2470	73 52 26	2465	75 34 29	2460	77 16 39	2455
	SUN	E.	82 4 47	2598	80 25 50	2596	78 46 50	2595	77 7 48	2594
30	α Aquilæ	W.	113 38 15	3288	115 2 41	3319	116 26 31	3352	117 49 43	3386
	Fomalhaut	W.	85 48 36	2445	87 31 7	2444	89 13 40	2443	90 56 13	2444
	α Pegasi	W.	67 9 54	2732	68 45 52	2720	70 22 6	2710	71 58 33	2701
	SATURN	W.	21 56 15	2283	23 42 39	2282	25 29 5	2282	27 15 31	2281
	SUN	E.	68 52 21	2591	67 13 14	2591	65 34 7	2592	63 55 1	2593
31	Fomalhaut	W.	99 28 37	2453	101 10 56	2457	102 53 9	2462	104 35 16	2467
	α Pegasi	W.	80 3 12	2675	81 40 26	2673	83 17 43	2671	84 55 2	2670
	SATURN	W.	36 7 39	2285	37 54 1	2286	39 40 22	2287	41 26 40	2289
	SUN	E.	55 39 53	2601	54 0 59	2604	52 22 8	2607	50 43 22	2610

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		<sup>h</sup> <sup>m</sup> <sup>s</sup>	<sup>s</sup>	<sup>°</sup> <sup>'</sup> <sup>"</sup>	<sup>"</sup>	<sup>'</sup> <sup>"</sup>	<sup>s</sup>	<sup>m</sup> <sup>s</sup>	<sup>s</sup>
Mon.	1	8 43 3.27	9.728	N. 18 11 22.9	-37.31	15 47.40	66.66	6 10.73	0.128
Tues.	2	8 46 56.46	9.703	17 56 18.9	38.04	15 47.52	66.57	6 7.36	0.153
Wed.	3	8 50 49.05	9.678	17 40 57.1	38.77	15 47.65	66.48	6 3.40	0.178
Thur.	4	8 54 41.04	9.653	17 25 17.9	-39.48	15 47.78	66.39	5 58.85	0.202
Frid.	5	8 58 32.42	9.628	17 9 21.8	40.19	15 47.92	66.31	5 53.70	0.227
Sat.	6	9 2 23.20	9.603	16 53 9.0	40.88	15 48.06	66.22	5 47.94	0.253
SUN.	7	9 6 13.39	9.578	16 36 39.8	-41.58	15 48.20	66.14	5 41.58	0.278
Mon.	8	9 10 2.96	9.553	16 19 54.5	42.22	15 48.35	66.05	5 34.62	0.303
Tues.	9	9 13 51.93	9.528	16 2 53.4	42.87	15 48.51	65.97	5 27.06	0.328
Wed.	10	9 17 40.31	9.503	15 45 36.9	-43.50	15 48.67	65.88	5 18.91	0.353
Thur.	11	9 21 28.09	9.478	15 28 5.3	44.13	15 48.83	65.80	5 10.16	0.378
Frid.	12	9 25 15.28	9.454	15 10 18.9	44.74	15 49.00	65.72	5 0.83	0.402
Sat.	13	9 29 1.89	9.430	14 52 17.9	-45.34	15 49.17	65.64	4 50.92	0.426
SUN.	14	9 32 47.93	9.406	14 34 2.7	45.92	15 49.34	65.56	4 40.44	0.449
Mon.	15	9 36 33.42	9.383	14 15 33.8	46.49	15 49.52	65.48	4 29.39	0.472
Tues.	16	9 40 18.35	9.360	13 56 51.5	-47.05	15 49.70	65.40	4 17.78	0.495
Wed.	17	9 44 2.74	9.338	13 37 55.9	47.60	15 49.89	65.33	4 5.63	0.517
Thur.	18	9 47 46.59	9.316	13 18 47.3	48.12	15 50.08	65.25	3 52.96	0.539
Frid.	19	9 51 29.93	9.295	12 59 26.2	-48.64	15 50.27	65.18	3 39.78	0.560
Sat.	20	9 55 12.76	9.275	12 39 52.8	49.15	15 50.46	65.11	3 26.10	0.580
SUN.	21	9 58 55.11	9.256	12 20 7.3	49.65	15 50.65	65.04	3 11.94	0.600
Mon.	22	10 2 37.00	9.237	12 0 10.2	-50.13	15 50.84	64.97	2 57.32	0.619
Tues.	23	10 6 18.45	9.218	11 40 1.7	50.60	15 51.04	64.91	2 42.25	0.637
Wed.	24	10 9 59.46	9.200	11 19 42.0	51.05	15 51.24	64.84	2 26.74	0.655
Thur.	25	10 13 40.04	9.183	10 59 11.5	-51.50	15 51.44	64.78	2 10.83	0.672
Frid.	26	10 17 20.23	9.166	10 38 30.5	51.93	15 51.64	64.72	1 54.52	0.688
Sat.	27	10 21 0.04	9.151	10 17 39.3	52.35	15 51.85	64.66	1 37.81	0.704
SUN.	28	10 24 39.47	9.137	9 56 38.1	-52.75	15 52.06	64.60	1 20.73	0.719
Mon.	29	10 28 18.55	9.123	9 35 27.3	53.15	15 52.27	64.55	1 3.31	0.733
Tues.	30	10 31 57.30	9.109	9 14 7.2	53.53	15 52.48	64.50	0 45.55	0.747
Wed.	31	10 35 35.72	9.095	8 52 38.1	53.90	15 52.70	64.45	0 27.46	0.760
Thur.	32	10 39 13.82	9.081	N. 8 31 0.4	-54.25	15 52.92	64.40	0 9.06	0.773

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18 from the sidereal time.  
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Mon.	1	8 43 2.27	9.729	N. 18 11 26.8	-37.30	6 10.74	0.128	8 36 51.53
Tues.	2	8 46 55.46	9.704	17 56 22.8	38.04	6 7.37	0.153	8 40 48.09
Wed.	3	8 50 48.06	9.679	17 41 1.0	38.77	6 3.41	0.178	8 44 44.65
Thur.	4	8 54 40.06	9.654	17 25 21.9	-39.48	5 58.86	0.202	8 48 41.20
Frid.	5	8 58 31.46	9.629	17 9 25.8	40.19	5 53.71	0.227	8 52 37.75
Sat.	6	9 2 22.26	9.604	16 53 13.0	40.88	5 47.96	0.253	8 56 34.31
SUN.	7	9 6 12.46	9.579	16 36 43.8	-41.56	5 41.60	0.278	9 0 30.87
Mon.	8	9 10 2.06	9.554	16 19 58.5	42.22	5 34.64	0.303	9 4 27.42
Tues.	9	9 13 51.06	9.529	16 2 57.3	42.87	5 27.08	0.328	9 8 23.98
Wed.	10	9 17 39.41	9.504	15 45 40.7	-43.50	5 18.93	0.353	9 12 20.53
Thur.	11	9 21 27.27	9.479	15 28 9.1	44.13	5 10.18	0.378	9 16 17.09
Frid.	12	9 25 14.49	9.455	15 10 22.6	44.74	5 0.85	0.402	9 20 13.65
Sat.	13	9 29 1.13	9.431	14 52 21.6	-45.34	4 50.93	0.426	9 24 10.20
SUN.	14	9 32 47.20	9.408	14 34 6.3	45.92	4 40.45	0.449	9 28 6.76
Mon.	15	9 36 32.71	9.385	14 15 37.3	46.49	4 29.41	0.472	9 32 3.31
Tues.	16	9 40 17.07	9.362	13 56 54.9	-47.05	4 17.81	0.495	9 35 59.87
Wed.	17	9 44 2.09	9.339	13 37 59.2	47.60	4 5.67	0.517	9 39 56.42
Thur.	18	9 47 45.98	9.317	13 18 50.4	48.12	3 53.00	0.539	9 43 52.98
Frid.	19	9 51 29.35	9.296	12 59 29.2	-48.64	3 39.82	0.560	9 47 49.53
Sat.	20	9 55 12.22	9.276	12 39 55.7	49.15	3 26.14	0.580	9 51 46.09
SUN.	21	9 58 54.61	9.256	12 20 10.0	49.65	3 11.97	0.600	9 55 42.64
Mon.	22	10 2 36.54	9.237	12 0 12.7	-50.13	2 57.34	0.619	9 59 39.20
Tues.	23	10 6 18.02	9.219	11 40 4.0	50.60	2 42.27	0.637	10 3 35.75
Wed.	24	10 9 59.07	9.201	11 19 44.1	51.05	2 26.76	0.655	10 7 32.31
Thur.	25	10 13 39.70	9.184	10 59 13.4	-51.50	2 10.84	0.672	10 11 28.86
Frid.	26	10 17 19.93	9.168	10 38 32.2	51.93	1 54.52	0.688	10 15 25.41
Sat.	27	10 20 59.78	9.152	10 17 40.7	52.35	1 37.81	0.704	10 19 21.97
SUN.	28	10 24 39.26	9.137	9 56 39.3	-52.75	1 20.74	0.719	10 23 18.52
Mon.	29	10 28 18.38	9.123	9 35 28.2	53.15	1 3.31	0.733	10 27 15.08
Tues.	30	10 31 57.17	9.109	9 14 7.9	53.53	0 45.55	0.747	10 31 11.63
Wed.	31	10 35 35.64	9.096	8 52 38.5	53.90	0 27.46	0.760	10 35 8.18
Thur.	32	10 39 13.79	9.083	N. 8 31 0.6	-54.25	0 9.05	0.773	10 39 4.74

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.

The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,  
+ 9<sup>s</sup>.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	213	128 20 25.1	20 8.6	143.56	+ 0.34	0.006 4131	- 22.3	h m s 15 20 37.24
2	214	129 17 51.3	17 34.7	143.61	0.46	0.006 3583	23.3	15 16 41.33
3	215	130 15 18.6	15 1.8	143.66	0.56	0.006 3012	24.3	15 12 45.42
4	216	131 12 46.9	12 30.0	143.71	+ 0.64	0.006 2417	- 25.3	15 8 49.50
5	217	132 10 16.3	9 59.2	143.75	0.69	0.006 1798	26.3	15 4 53.59
6	218	133 7 46.7	7 29.4	143.78	0.71	0.006 1155	27.3	15 0 57.68
7	219	134 5 18.0	5 0.6	143.82	+ 0.70	0.006 0489	- 28.3	14 57 1.77
8	220	135 2 50.2	2 32.7	143.86	0.65	0.005 9800	29.2	14 53 5.86
9	221	136 0 23.4	0 5.7	143.90	0.59	0.005 9089	30.1	14 49 9.95
10	222	136 57 57.4	57 39.6	143.94	+ 0.50	0.005 8358	- 30.9	14 45 14.04
11	223	137 55 32.3	55 14.4	143.97	0.40	0.005 7607	31.7	14 41 18.13
12	224	138 53 8.2	52 50.1	144.01	0.28	0.005 6838	32.4	14 37 22.22
13	225	139 50 45.0	50 26.7	144.05	+ 0.17	0.005 6052	- 33.1	14 33 26.31
14	226	140 48 22.8	48 4.3	144.09	+ 0.06	0.005 5250	33.7	14 29 30.40
15	227	141 46 1.6	45 43.0	144.14	- 0.06	0.005 4433	34.3	14 25 34.50
16	228	142 43 41.4	43 22.7	144.18	- 0.16	0.005 3603	- 34.8	14 21 38.59
17	229	143 41 22.3	41 3.4	144.23	0.24	0.005 2760	35.3	14 17 42.68
18	230	144 39 4.3	38 45.3	144.28	0.30	0.005 1906	35.8	14 13 46.77
19	231	145 36 47.5	36 28.4	144.33	- 0.34	0.005 1042	- 36.2	14 9 50.86
20	232	146 34 32.0	34 12.8	144.38	0.35	0.005 0169	36.6	14 5 54.95
21	233	147 32 17.9	31 58.6	144.44	0.33	0.004 9287	37.0	14 1 59.04
22	234	148 30 5.3	29 45.8	144.51	- 0.28	0.004 8397	- 37.3	13 58 3.13
23	235	149 27 54.2	27 34.6	144.57	0.20	0.004 7499	37.6	13 54 7.22
24	236	150 25 44.8	25 25.1	144.64	- 0.10	0.004 6592	38.0	13 50 11.32
25	237	151 23 37.1	23 17.3	144.71	+ 0.02	0.004 5675	- 38.4	13 46 15.41
26	238	152 21 31.2	21 11.3	144.79	0.16	0.004 4747	38.9	13 42 19.50
27	239	153 19 27.2	19 7.1	144.87	0.30	0.004 3808	39.4	13 38 23.59
28	240	154 17 25.0	17 4.8	144.95	+ 0.43	0.004 2856	- 40.0	13 34 27.68
29	241	155 15 24.7	15 4.4	145.03	0.55	0.004 1890	40.6	13 30 31.77
30	242	156 13 26.3	13 5.8	145.11	0.65	0.004 0909	41.2	13 26 35.87
31	243	157 11 29.7	11 9.1	145.18	0.72	0.003 9912	41.8	13 22 39.96
32	244	158 9 35.0	9 14.3	145.26	+ 0.79	0.003 8898	- 42.5	13 18 44.05
NOTE.—The numbers in column $\lambda$ correspond to the true equinox of the date; in column $\lambda'$ to the mean equinox of January 0 <sup>d</sup> .								Diff. for 1 Hour, — 9 <sup>s</sup> .8296. (Table II.)

## GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	16 10.1	16 8.4	59 14.4	-0.44	59 8.3	-0.59	h m 21 28.3	m 2.56	d 25.6
2	16 6.3	16 3.6	59 0.2	0.75	58 50.3	0.90	22 29.6	2.53	26.6
3	16 0.3	15 56.6	58 38.5	1.06	58 24.9	1.20	23 28.8	2.40	27.6
4	15 52.5	15 47.9	58 9.7	-1.33	57 53.0	-1.44	♄	.	28.6
5	15 43.1	15 38.0	57 35.2	1.53	57 16.4	1.59	0 24.3	2.21	0.2
6	15 32.7	15 27.3	56 57.0	1.63	56 37.4	1.63	1 15.3	2.03	1.2
7	15 22.0	15 16.8	56 17.9	-1.61	55 58.8	-1.56	2 2.1	1.88	2.2
8	15 11.8	15 7.2	55 40.5	1.48	55 23.3	1.37	2 45.8	1.77	3.2
9	15 2.9	14 59.0	55 7.6	1.24	54 53.6	1.09	3 27.4	1.70	4.2
10	14 55.7	14 53.0	54 41.5	-0.92	54 31.5	-0.74	4 8.1	1.69	5.2
11	14 50.9	14 49.5	54 23.8	0.54	54 18.6	-0.33	4 48.9	1.72	6.2
12	14 48.8	14 48.7	54 15.9	-0.12	54 15.8	+0.10	5 31.0	1.79	7.2
13	14 49.4	14 50.7	54 18.2	+0.31	54 23.2	+0.53	6 15.1	1.89	8.2
14	14 52.8	14 55.5	54 30.8	0.73	54 40.7	0.93	7 2.1	2.02	9.2
15	14 58.8	15 2.7	54 52.9	1.11	55 7.2	1.28	7 52.1	2.15	10.2
16	15 7.1	15 12.0	55 23.4	+1.42	55 41.3	+1.54	8 44.9	2.25	11.2
17	15 17.2	15 22.7	56 0.4	1.63	56 20.5	1.70	9 39.6	2.29	12.2
18	15 28.4	15 34.1	56 41.3	1.74	57 2.3	1.74	10 34.6	2.28	13.2
19	15 39.8	15 45.3	57 23.2	+1.71	57 43.5	+1.65	11 28.7	2.22	14.2
20	15 50.6	15 55.5	58 2.9	1.56	58 21.0	1.44	12 21.1	2.14	15.2
21	16 0.0	16 4.0	58 37.5	1.29	58 52.0	1.13	13 11.7	2.07	16.2
22	16 7.4	16 10.2	59 4.4	+0.95	59 14.7	+0.76	14 0.9	2.03	17.2
23	16 12.3	16 13.9	59 22.7	0.57	59 28.3	0.38	14 49.6	2.04	18.2
24	16 14.8	16 15.1	59 31.7	+0.20	59 32.9	+0.03	15 39.1	2.09	19.2
25	16 14.9	16 14.3	59 32.2	-0.14	59 29.7	-0.28	16 30.4	2.19	20.2
26	16 13.1	16 11.6	59 25.5	0.40	59 19.9	0.52	17 24.4	2.32	21.2
27	16 9.8	16 7.6	59 13.1	0.62	59 5.1	0.70	18 21.5	2.44	22.2
28	16 5.2	16 2.5	58 56.2	-0.78	58 46.4	-0.85	19 21.0	2.51	23.2
29	15 59.6	15 56.5	58 35.8	0.91	58 24.5	0.97	20 21.2	2.50	24.2
30	15 53.2	15 49.8	58 12.5	1.03	57 59.9	1.08	21 20.0	2.40	25.2
31	15 46.2	15 42.4	57 46.6	1.13	57 32.7	1.18	22 15.8	2.25	26.2
32	15 38.4	15 34.4	57 18.2	-1.22	57 3.3	-1.26	23 7.6	2.08	27.2

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.		
MONDAY 1.							WEDNESDAY 3.								
0	h	m	s	"	"	"	0	h	m	s	"	"	"		
0	5	12	40.40	2.5777	N.25	3 0.8	5.741	0	7	17	58.62	2.5853	N.26	15 4.6	2.775
1	5	15	15.17	2.5812	25	8 40.2	5.573	1	7	20	33.63	2.5817	26	12 12.9	2.947
2	5	17	50.14	2.5845	25	14 9.5	5.403	2	7	23	8.42	2.5780	26	9 11.0	3.118
3	5	20	25.31	2.5878	25	19 28.6	5.233	3	7	25	42.99	2.5742	26	5 58.8	3.288
4	5	23	0.67	2.5909	25	24 37.4	5.061	4	7	28	17.33	2.5703	26	2 36.5	3.457
5	5	25	36.22	2.5940	25	29 35.9	4.889	5	7	30	51.42	2.5661	25	59 4.0	3.626
6	5	28	11.95	2.5969	25	34 24.1	4.717	6	7	33	25.26	2.5619	25	55 21.4	3.793
7	5	30	47.85	2.5997	25	39 1.9	4.543	7	7	35	58.85	2.5576	25	51 28.8	3.960
8	5	33	23.91	2.6023	25	43 29.3	4.369	8	7	38	32.17	2.5531	25	47 26.2	4.126
9	5	36	0.13	2.6049	25	47 46.2	4.194	9	7	41	5.22	2.5485	25	43 13.7	4.290
10	5	38	36.50	2.6073	25	51 52.6	4.018	10	7	43	37.99	2.5438	25	38 51.4	4.453
11	5	41	13.00	2.6094	25	55 48.4	3.842	11	7	46	10.48	2.5390	25	34 19.3	4.616
12	5	43	49.63	2.6116	25	59 33.6	3.665	12	7	48	42.67	2.5340	25	29 37.5	4.777
13	5	46	26.39	2.6136	26	3 8.2	3.488	13	7	51	14.56	2.5290	25	24 46.1	4.937
14	5	49	3.26	2.6153	26	6 32.1	3.310	14	7	53	46.15	2.5238	25	19 45.1	5.096
15	5	51	40.23	2.6170	26	9 45.4	3.132	15	7	56	17.42	2.5185	25	14 34.6	5.253
16	5	54	17.30	2.6186	26	12 47.9	2.953	16	7	58	48.37	2.5132	25	9 14.7	5.409
17	5	56	54.46	2.6199	26	15 39.7	2.773	17	8	1	19.00	2.5077	25	3 45.5	5.564
18	5	59	31.69	2.6211	26	18 20.7	2.593	18	8	3	49.29	2.5021	24	58 7.0	5.718
19	6	2	8.99	2.6222	26	20 50.9	2.414	19	8	6	19.25	2.4964	24	52 19.3	5.871
20	6	4	46.35	2.6232	26	23 10.4	2.234	20	8	8	48.86	2.4907	24	46 22.5	6.023
21	6	7	23.77	2.6240	26	25 19.0	2.053	21	8	11	18.13	2.4848	24	40 16.6	6.173
22	6	10	1.23	2.6246	26	27 16.8	1.873	22	8	13	47.04	2.4789	24	34 1.8	6.321
23	6	12	38.72	2.6250	N.26	29 3.7	1.692	23	8	16	15.60	2.4729	N.24	27 38.1	6.468
TUESDAY 2.							THURSDAY 4.								
0	6	15	16.23	2.6253	N.26	30 39.8	1.511	0	8	18	43.79	2.4668	N.24	21 5.6	6.614
1	6	17	53.75	2.6254	26	32 5.0	1.329	1	8	21	11.62	2.4607	24	14 24.4	6.758
2	6	20	31.28	2.6254	26	33 19.3	1.148	2	8	23	39.07	2.4544	24	7 34.6	6.902
3	6	23	8.80	2.6253	26	34 22.8	0.968	3	8	26	6.15	2.4482	24	0 36.2	7.043
4	6	25	46.31	2.6249	26	35 15.4	0.786	4	8	28	32.85	2.4418	23	53 29.4	7.183
5	6	28	23.79	2.6243	26	35 57.1	0.605	5	8	30	59.16	2.4353	23	46 14.2	7.322
6	6	31	1.23	2.6237	26	36 28.0	0.424	6	8	33	25.09	2.4288	23	38 50.8	7.459
7	6	33	38.63	2.6229	26	36 48.0	0.243	7	8	35	50.62	2.4223	23	31 19.1	7.595
8	6	36	15.98	2.6220	26	36 57.1	+0.062	8	8	38	15.76	2.4157	23	23 39.4	7.728
9	6	38	53.27	2.6209	26	36 55.4	-0.118	9	8	40	40.50	2.4091	23	15 51.7	7.862
10	6	41	30.49	2.6196	26	36 42.9	0.298	10	8	43	4.85	2.4024	23	7 56.0	7.993
11	6	44	7.62	2.6181	26	36 19.6	0.478	11	8	45	28.79	2.3956	22	59 52.5	8.123
12	6	46	44.66	2.6165	26	35 45.5	0.658	12	8	47	52.32	2.3888	22	51 41.3	8.251
13	6	49	21.60	2.6147	26	35 0.6	0.838	13	8	50	15.45	2.3820	22	43 22.4	8.378
14	6	51	58.43	2.6128	26	34 5.0	1.016	14	8	52	38.16	2.3751	22	34 56.0	8.502
15	6	54	35.14	2.6107	26	32 58.7	1.194	15	8	55	0.46	2.3683	22	26 22.2	8.625
16	6	57	11.72	2.6085	26	31 41.7	1.373	16	8	57	22.35	2.3613	22	17 41.0	8.748
17	6	59	48.16	2.6061	26	30 14.0	1.550	17	8	59	43.82	2.3543	22	8 52.5	8.868
18	7	2	24.45	2.6036	26	28 35.7	1.727	18	9	2	4.87	2.3474	21	59 56.8	8.987
19	7	5	0.59	2.6009	26	26 46.8	1.903	19	9	4	25.51	2.3404	21	50 54.1	9.103
20	7	7	36.56	2.5981	26	24 47.3	2.079	20	9	6	45.72	2.3333	21	41 44.4	9.219
21	7	10	12.36	2.5951	26	22 37.3	2.254	21	9	9	5.51	2.3263	21	32 27.8	9.333
22	7	12	47.97	2.5919	26	20 16.8	2.428	22	9	11	24.88	2.3193	21	23 4.4	9.446
23	7	15	23.39	2.5887	26	17 45.9	2.602	23	9	13	43.83	2.3123	21	13 34.3	9.557
24	7	17	58.62	2.5853	N.26	15 4.6	2.775	24	9	16	2.35	2.3052	N.21	3 57.6	9.666

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 5.					SUNDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 16 2.35	2.3052	N. 21 3 57.6	9.666	0	10 58 55.39	1.9971	N. 11 43 29.8	13.128
1	9 18 20.45	2.2981	20 54 14.4	9.773	1	11 0 55.06	1.9919	11 30 21.0	13.166
2	9 20 38.12	2.2910	20 44 24.8	9.879	2	11 2 54.42	1.9868	11 17 9.9	13.203
3	9 22 55.37	2.2840	20 34 28.9	9.984	3	11 4 53.48	1.9818	11 3 56.7	13.238
4	9 25 12.20	2.2770	20 24 26.7	10.087	4	11 6 52.24	1.9768	10 50 41.3	13.273
5	9 27 28.61	2.2699	20 14 18.5	10.188	5	11 8 50.70	1.9719	10 37 23.9	13.307
6	9 29 44.59	2.2628	20 4 4.2	10.288	6	11 10 48.87	1.9671	10 24 4.5	13.339
7	9 32 0.15	2.2558	19 53 44.0	10.386	7	11 12 46.75	1.9623	10 10 43.2	13.370
8	9 34 15.28	2.2487	19 43 17.9	10.483	8	11 14 44.34	1.9575	9 57 20.1	13.400
9	9 36 29.99	2.2417	19 32 46.0	10.578	9	11 16 41.65	1.9529	9 43 55.2	13.429
10	9 38 44.28	2.2347	19 22 8.5	10.671	10	11 18 38.69	1.9484	9 30 28.6	13.458
11	9 40 58.15	2.2278	19 11 25.5	10.763	11	11 20 35.46	1.9439	9 17 0.3	13.484
12	9 43 11.61	2.2208	19 0 37.0	10.853	12	11 22 31.96	1.9395	9 3 30.5	13.509
13	9 45 24.65	2.2138	18 49 43.1	10.942	13	11 24 28.20	1.9352	8 49 59.2	13.534
14	9 47 37.27	2.2068	18 38 44.0	11.028	14	11 26 24.18	1.9308	8 36 26.4	13.558
15	9 49 49.47	2.2000	18 27 39.7	11.114	15	11 28 19.90	1.9266	8 22 52.3	13.580
16	9 52 1.27	2.1932	18 16 30.3	11.198	16	11 30 15.37	1.9225	8 9 16.8	13.602
17	9 54 12.65	2.1863	18 5 15.9	11.281	17	11 32 10.60	1.9184	7 55 40.1	13.621
18	9 56 23.62	2.1795	17 53 56.6	11.362	18	11 34 5.58	1.9144	7 42 2.3	13.640
19	9 58 34.19	2.1728	17 42 32.5	11.442	19	11 36 0.33	1.9105	7 28 23.3	13.659
20	10 0 44.35	2.1660	17 31 3.6	11.520	20	11 37 54.84	1.9067	7 14 43.2	13.677
21	10 2 54.11	2.1593	17 19 30.1	11.596	21	11 39 49.13	1.9029	7 1 2.1	13.693
22	10 5 3.47	2.1527	17 7 52.1	11.671	22	11 41 43.19	1.8992	6 47 20.1	13.708
23	10 7 12.43	2.1460	N. 16 56 9.6	11.745	23	11 43 37.03	1.8956	N. 6 33 37.2	13.722
SATURDAY 6.					MONDAY 8.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	10 9 20.99	2.1394	N. 16 44 22.7	11.817	0	11 45 30.66	1.8921	N. 6 19 53.5	13.735
1	10 11 29.16	2.1329	16 32 31.6	11.888	1	11 47 24.08	1.8886	6 6 9.0	13.747
2	10 13 36.94	2.1264	16 20 36.2	11.957	2	11 49 17.29	1.8852	5 52 23.8	13.758
3	10 15 44.33	2.1199	16 8 36.8	12.023	3	11 51 10.30	1.8818	5 38 38.0	13.768
4	10 17 51.33	2.1135	15 56 33.4	12.090	4	11 53 3.11	1.8786	5 24 51.6	13.778
5	10 19 57.95	2.1073	15 44 26.0	12.155	5	11 54 55.73	1.8754	5 11 4.6	13.787
6	10 22 4.20	2.1010	15 32 14.8	12.218	6	11 56 48.16	1.8723	4 57 17.2	13.794
7	10 24 10.07	2.0947	15 19 59.8	12.280	7	11 58 40.40	1.8693	4 43 29.3	13.802
8	10 26 15.56	2.0884	15 7 41.2	12.340	8	12 0 32.47	1.8663	4 29 41.0	13.807
9	10 28 20.68	2.0823	14 55 19.0	12.399	9	12 2 24.36	1.8634	4 15 52.5	13.811
10	10 30 25.44	2.0763	14 42 53.3	12.457	10	12 4 16.08	1.8607	4 2 3.7	13.815
11	10 32 29.83	2.0702	14 30 24.1	12.514	11	12 6 7.64	1.8579	3 48 14.7	13.818
12	10 34 33.86	2.0643	14 17 51.6	12.569	12	12 7 59.03	1.8552	3 34 25.5	13.821
13	10 36 37.54	2.0583	14 5 15.8	12.623	13	12 9 50.26	1.8526	3 20 36.2	13.822
14	10 38 40.86	2.0524	13 52 36.9	12.674	14	12 11 41.34	1.8501	3 6 46.9	13.822
15	10 40 43.83	2.0466	13 39 54.9	12.726	15	12 13 32.27	1.8477	2 52 57.6	13.822
16	10 42 46.45	2.0408	13 27 9.8	12.776	16	12 15 23.06	1.8453	2 39 8.3	13.821
17	10 44 48.73	2.0352	13 14 21.8	12.824	17	12 17 13.71	1.8430	2 25 19.1	13.819
18	10 46 50.67	2.0295	13 1 30.9	12.871	18	12 19 4.22	1.8408	2 11 30.0	13.816
19	10 48 52.27	2.0239	12 48 37.3	12.917	19	12 20 54.60	1.8387	1 57 41.2	13.812
20	10 50 53.54	2.0185	12 35 40.9	12.962	20	12 22 44.86	1.8367	1 43 52.6	13.808
21	10 52 54.49	2.0131	12 22 41.9	13.005	21	12 24 35.00	1.8347	1 30 4.3	13.803
22	10 54 55.11	2.0077	12 9 40.3	13.047	22	12 26 25.02	1.8327	1 16 16.3	13.797
23	10 56 55.41	2.0023	11 56 36.3	13.088	23	12 28 14.92	1.8308	1 2 28.7	13.789
24	10 58 55.39	1.9971	N. 11 43 29.8	13.128	24	12 30 4.72	1.8291	N. 0 48 41.6	13.781

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 9.					THURSDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	12 30 4.72	1.8291	N. 0 48 41.6	13.781	0	13 57 11.82	1.8278	S. 9 50 4.4	12.569
1	12 31 54.41	1.8273	0 34 55.0	13.773	1	13 59 1.54	1.8295	10 2 37.3	12.528
2	12 33 44.00	1.8257	0 21 8.9	13.763	2	14 0 51.36	1.8313	10 15 7.7	12.486
3	12 35 33.50	1.8242	N. 0 7 23.4	13.754	3	14 2 41.29	1.8330	10 27 35.6	12.443
4	12 37 22.90	1.8227	S. 0 6 21.6	13.743	4	14 4 31.32	1.8348	10 40 0.8	12.398
5	12 39 12.22	1.8213	0 20 5.8	13.731	5	14 6 21.47	1.8368	10 52 23.4	12.354
6	12 41 1.45	1.8199	0 33 49.3	13.719	6	14 8 11.73	1.8387	11 4 43.3	12.309
7	12 42 50.61	1.8187	0 47 32.1	13.706	7	14 10 2.11	1.8408	11 17 0.5	12.263
8	12 44 39.69	1.8175	1 1 14.0	13.692	8	14 11 52.62	1.8428	11 29 14.9	12.217
9	12 46 28.71	1.8164	1 14 55.1	13.678	9	14 13 43.25	1.8450	11 41 26.5	12.170
10	12 48 17.66	1.8153	1 28 35.3	13.662	10	14 15 34.02	1.8473	11 53 35.3	12.122
11	12 50 6.55	1.8143	1 42 14.5	13.646	11	14 17 24.93	1.8496	12 5 41.2	12.073
12	12 51 55.38	1.8134	1 55 52.8	13.629	12	14 19 15.97	1.8519	12 17 44.1	12.024
13	12 53 44.16	1.8127	2 9 30.0	13.612	13	14 21 7.16	1.8543	12 29 44.1	11.974
14	12 55 32.90	1.8119	2 23 6.2	13.594	14	14 22 58.49	1.8568	12 41 41.0	11.923
15	12 57 21.59	1.8112	2 36 41.3	13.575	15	14 24 49.97	1.8593	12 53 34.9	11.873
16	12 59 10.24	1.8106	2 50 15.2	13.555	16	14 26 41.60	1.8618	13 5 25.7	11.821
17	13 0 58.86	1.8100	3 3 47.9	13.535	17	14 28 33.39	1.8646	13 17 13.4	11.768
18	13 2 47.44	1.8095	3 17 19.4	13.514	18	14 30 25.35	1.8673	13 28 57.9	11.715
19	13 4 36.00	1.8092	3 30 49.6	13.493	19	14 32 17.47	1.8700	13 40 39.2	11.661
20	13 6 24.54	1.8088	3 44 18.5	13.470	20	14 34 9.75	1.8728	13 52 17.2	11.606
21	13 8 13.06	1.8086	3 57 46.0	13.447	21	14 36 2.21	1.8758	14 3 51.9	11.551
22	13 10 1.57	1.8084	4 11 12.1	13.423	22	14 37 54.85	1.8788	14 15 23.3	11.495
23	13 11 50.07	1.8083	S. 4 24 36.7	13.398	23	14 39 47.66	1.8817	S. 14 26 51.3	11.438
WEDNESDAY 10.					FRIDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	13 13 38.56	1.8082	S. 4 37 59.9	13.373	0	14 41 40.65	1.8848	S. 14 38 15.9	11.381
1	13 15 27.05	1.8083	4 51 21.5	13.348	1	14 43 33.83	1.8878	14 49 37.0	11.323
2	13 17 15.55	1.8083	5 4 41.6	13.321	2	14 45 27.19	1.8910	15 0 54.6	11.263
3	13 19 4.05	1.8085	5 18 0.0	13.293	3	14 47 20.75	1.8943	15 12 8.6	11.203
4	13 20 52.57	1.8088	5 31 16.8	13.266	4	14 49 14.50	1.8975	15 23 19.0	11.143
5	13 22 41.11	1.8091	5 44 31.9	13.237	5	14 51 8.45	1.9008	15 34 25.8	11.083
6	13 24 29.66	1.8094	5 57 45.3	13.208	6	14 53 2.60	1.9043	15 45 28.9	11.020
7	13 26 18.24	1.8099	6 10 56.9	13.178	7	14 54 56.96	1.9077	15 56 28.2	10.958
8	13 28 6.85	1.8104	6 24 6.7	13.148	8	14 56 51.52	1.9112	16 7 23.8	10.894
9	13 29 55.49	1.8110	6 37 14.6	13.117	9	14 58 46.30	1.9148	16 18 15.5	10.830
10	13 31 44.17	1.8117	6 50 20.7	13.085	10	15 0 41.29	1.9183	16 29 3.4	10.766
11	13 33 32.89	1.8123	7 3 24.8	13.052	11	15 2 36.50	1.9219	16 39 47.4	10.700
12	13 35 21.65	1.8131	7 16 26.9	13.018	12	15 4 31.92	1.9256	16 50 27.4	10.633
13	13 37 10.46	1.8140	7 29 27.0	12.985	13	15 6 27.57	1.9294	17 1 3.4	10.567
14	13 38 59.33	1.8150	7 42 25.1	12.951	14	15 8 23.45	1.9332	17 11 35.4	10.499
15	13 40 48.26	1.8159	7 55 21.1	12.915	15	15 10 19.55	1.9370	17 22 3.3	10.430
16	13 42 37.24	1.8169	8 8 14.9	12.879	16	15 12 15.89	1.9409	17 32 27.0	10.361
17	13 44 26.29	1.8181	8 21 6.6	12.843	17	15 14 12.46	1.9448	17 42 46.6	10.291
18	13 46 15.41	1.8193	8 33 56.1	12.806	18	15 16 9.26	1.9488	17 53 1.9	10.220
19	13 48 4.61	1.8206	8 46 43.3	12.768	19	15 18 6.31	1.9528	18 3 13.0	10.148
20	13 49 53.88	1.8218	8 59 28.3	12.730	20	15 20 3.60	1.9568	18 13 19.7	10.076
21	13 51 43.23	1.8232	9 12 10.9	12.691	21	15 22 1.13	1.9609	18 23 22.1	10.003
22	13 53 32.67	1.8248	9 24 51.2	12.651	22	15 23 58.91	1.9651	18 33 20.0	9.928
23	13 55 22.20	1.8263	9 37 29.0	12.610	23	15 25 56.94	1.9693	18 43 13.5	9.853
24	13 57 11.82	1.8278	S. 9 50 4.4	12.569	24	15 27 55.22	1.9735	S. 18 53 2.4	9.778



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 13.					MONDAY 15.				
0	15 27 55.22	1.9735	S. 18 53 2.4	9.778	0	17 8 0.91	2.2011	S. 24 59 5.2	5.138
1	15 29 53.76	1.9778	19 2 46.8	9.701	1	17 10 13.12	2.2058	25 4 9.9	5.019
2	15 31 52.55	1.9820	19 12 26.5	9.623	2	17 12 25.60	2.2103	25 9 7.5	4.901
3	15 33 51.60	1.9864	19 22 1.6	9.546	3	17 14 38.36	2.2150	25 13 58.0	4.781
4	15 35 50.92	1.9908	19 31 32.0	9.468	4	17 16 51.40	2.2196	25 18 41.2	4.660
5	15 37 50.50	1.9952	19 40 57.7	9.388	5	17 19 4.71	2.2241	25 23 17.2	4.538
6	15 39 50.34	1.9996	19 50 18.5	9.307	6	17 21 18.29	2.2287	25 27 45.8	4.416
7	15 41 50.45	2.0041	19 59 34.5	9.225	7	17 23 32.15	2.2332	25 32 7.1	4.293
8	15 43 50.83	2.0086	20 8 45.5	9.143	8	17 25 46.27	2.2376	25 36 20.9	4.168
9	15 45 51.48	2.0132	20 17 51.6	9.060	9	17 28 0.65	2.2420	25 40 27.3	4.043
10	15 47 52.41	2.0178	20 26 52.7	8.976	10	17 30 15.30	2.2463	25 44 26.1	3.918
11	15 49 53.61	2.0223	20 35 48.7	8.891	11	17 32 30.21	2.2506	25 48 17.4	3.791
12	15 51 55.09	2.0269	20 44 39.6	8.805	12	17 34 45.38	2.2549	25 52 1.0	3.663
13	15 53 56.84	2.0316	20 53 25.3	8.718	13	17 37 0.81	2.2592	25 55 37.0	3.536
14	15 55 58.88	2.0363	21 2 5.8	8.632	14	17 39 16.48	2.2633	25 59 5.3	3.407
15	15 58 1.20	2.0410	21 10 41.1	8.543	15	17 41 32.40	2.2674	26 2 25.8	3.277
16	16 0 3.80	2.0458	21 19 11.0	8.454	16	17 43 48.56	2.2714	26 5 38.5	3.147
17	16 2 6.69	2.0505	21 27 35.6	8.364	17	17 46 4.97	2.2754	26 8 43.4	3.015
18	16 4 9.86	2.0553	21 35 54.7	8.273	18	17 48 21.62	2.2794	26 11 40.3	2.883
19	16 6 13.32	2.0601	21 44 8.4	8.182	19	17 50 38.50	2.2833	26 14 29.3	2.750
20	16 8 17.07	2.0649	21 52 16.5	8.089	20	17 52 55.61	2.2871	26 17 10.3	2.617
21	16 10 21.11	2.0698	22 0 19.1	7.996	21	17 55 12.95	2.2909	26 19 43.3	2.483
22	16 12 25.44	2.0746	22 8 16.0	7.902	22	17 57 30.52	2.2946	26 22 8.2	2.348
23	16 14 30.06	2.0794	S. 22 16 7.3	7.807	23	17 59 48.30	2.2982	S. 26 24 25.0	2.212
SUNDAY 14.					TUESDAY 16.				
0	16 16 34.97	2.0843	S. 22 23 52.8	7.710	0	18 2 6.30	2.3018	S. 26 26 33.6	2.076
1	16 18 40.17	2.0892	22 31 32.5	7.613	1	18 4 24.51	2.3053	26 28 34.1	1.939
2	16 20 45.67	2.0941	22 39 6.4	7.516	2	18 6 42.93	2.3087	26 30 26.3	1.801
3	16 22 51.46	2.0989	22 46 34.4	7.417	3	18 9 1.55	2.3121	26 32 10.2	1.663
4	16 24 57.54	2.1038	22 53 56.4	7.317	4	18 11 20.38	2.3154	26 33 45.8	1.524
5	16 27 3.92	2.1088	23 1 12.4	7.217	5	18 13 39.40	2.3186	26 35 13.1	1.385
6	16 29 10.59	2.1137	23 8 22.4	7.116	6	18 15 58.61	2.3218	26 36 32.0	1.245
7	16 31 17.56	2.1187	23 15 26.3	7.013	7	18 18 18.01	2.3248	26 37 42.5	1.104
8	16 33 24.83	2.1236	23 22 24.0	6.910	8	18 20 37.59	2.3278	26 38 44.5	0.963
9	16 35 32.39	2.1285	23 29 15.5	6.806	9	18 22 57.34	2.3307	26 39 38.0	0.821
10	16 37 40.25	2.1334	23 36 0.7	6.701	10	18 25 17.27	2.3335	26 40 23.0	0.679
11	16 39 48.40	2.1383	23 42 39.6	6.595	11	18 27 37.36	2.3363	26 40 59.5	0.537
12	16 41 56.84	2.1432	23 49 12.1	6.488	12	18 29 57.62	2.3389	26 41 27.4	0.393
13	16 44 5.58	2.1481	23 55 38.2	6.381	13	18 32 18.03	2.3415	26 41 46.7	0.249
14	16 46 14.61	2.1529	24 1 57.8	6.272	14	18 34 38.60	2.3440	26 41 57.3	-0.104
15	16 48 23.93	2.1578	24 8 10.8	6.163	15	18 36 59.31	2.3463	26 41 59.2	+0.041
16	16 50 33.55	2.1628	24 14 17.3	6.053	16	18 39 20.16	2.3487	26 41 52.4	0.186
17	16 52 43.46	2.1676	24 20 17.1	5.941	17	18 41 41.15	2.3509	26 41 36.9	0.331
18	16 54 53.66	2.1724	24 26 10.2	5.829	18	18 44 2.27	2.3531	26 41 12.7	0.477
19	16 57 4.15	2.1773	24 31 56.6	5.716	19	18 46 23.52	2.3552	26 40 39.7	0.623
20	16 59 14.93	2.1821	24 37 36.1	5.602	20	18 48 44.89	2.3572	26 39 57.9	0.770
21	17 1 26.00	2.1868	24 43 8.8	5.488	21	18 51 6.38	2.3590	26 39 7.3	0.918
22	17 3 37.35	2.1916	24 48 34.6	5.372	22	18 53 27.97	2.3608	26 38 7.8	1.065
23	17 5 48.99	2.1963	24 53 53.4	5.255	23	18 55 49.67	2.3625	26 36 59.5	1.213
24	17 8 0.91	2.2011	S. 24 59 5.2	5.138	24	18 58 11.47	2.3641	S. 26 35 42.3	1.361

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 17.					FRIDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	18 58 11.47	2.3641	S. 26 35 42.3	1.361	1	20 51 47.34	2.3373	S. 22 39 25.1	8.388
2	19 0 33.36	2.3656	26 34 16.2	1.509	2	20 54 7.51	2.3349	22 30 57.7	8.524
3	19 2 55.34	2.3670	26 32 41.2	1.658	3	20 56 27.53	2.3325	22 22 22.2	8.659
4	19 5 17.40	2.3683	26 30 57.3	1.807	4	20 58 47.41	2.3301	22 13 38.6	8.793
5	19 7 39.54	2.3696	26 29 4.4	1.956	5	21 1 7.14	2.3275	22 4 47.0	8.927
6	19 10 1.75	2.3707	26 27 2.6	2.104	6	21 3 26.71	2.3249	21 55 47.4	9.060
7	19 12 24.02	2.3717	26 24 51.8	2.254	7	21 5 46.13	2.3224	21 46 39.8	9.192
8	19 14 46.35	2.3727	26 22 32.1	2.404	8	21 8 5.40	2.3198	21 37 24.4	9.323
9	19 17 8.74	2.3736	26 20 3.4	2.553	9	21 10 24.50	2.3171	21 28 1.1	9.453
10	19 19 31.18	2.3743	26 17 25.7	2.703	10	21 12 43.45	2.3144	21 18 30.1	9.582
11	19 21 53.66	2.3749	26 14 39.1	2.853	11	21 15 2.23	2.3116	21 8 51.3	9.710
12	19 24 16.18	2.3756	26 11 43.4	3.003	12	21 17 20.84	2.3088	20 59 4.9	9.837
13	19 26 38.73	2.3760	26 8 38.7	3.153	13	21 19 39.29	2.3061	20 49 10.9	9.963
14	19 29 1.30	2.3764	26 5 25.0	3.303	14	21 21 57.57	2.3032	20 39 9.3	10.088
15	19 31 23.89	2.3767	26 2 2.3	3.453	15	21 24 15.68	2.3003	20 29 0.3	10.213
16	19 33 46.50	2.3769	25 58 30.6	3.603	16	21 26 33.61	2.2974	20 18 43.8	10.337
17	19 36 9.12	2.3771	25 54 50.0	3.753	17	21 28 51.37	2.2946	20 8 19.9	10.459
18	19 38 31.75	2.3771	25 51 0.4	3.902	18	21 31 8.96	2.2917	19 57 48.7	10.580
19	19 40 54.37	2.3770	25 47 1.8	4.052	19	21 33 26.37	2.2887	19 47 10.3	10.700
20	19 43 16.99	2.3769	25 42 54.2	4.202	20	21 35 43.60	2.2857	19 36 24.7	10.820
21	19 45 39.60	2.3767	25 38 37.6	4.351	21	21 38 0.65	2.2828	19 25 31.9	10.938
22	19 48 2.19	2.3763	25 34 12.1	4.500	22	21 40 17.53	2.2798	19 14 32.1	11.055
23	19 50 24.75	2.3758	25 29 37.6	4.649	23	21 42 34.22	2.2767	19 3 25.3	11.171
24	19 52 47.29	2.3753	S. 25 24 54.2	4.798	24	21 44 50.73	2.2737	S. 18 52 11.6	11.286
THURSDAY 18.					SATURDAY 20.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
1	19 55 9.79	2.3748	S. 25 20 1.8	4.948	1	21 47 7.06	2.2707	S. 18 40 51.0	11.400
2	19 57 32.26	2.3741	25 15 0.5	5.096	2	21 49 23.21	2.2676	18 29 23.6	11.512
3	19 59 54.68	2.3733	25 9 50.3	5.243	3	21 51 39.17	2.2645	18 17 49.5	11.623
4	20 2 17.05	2.3724	25 4 31.3	5.391	4	21 53 54.95	2.2615	18 6 8.8	11.733
5	20 4 39.37	2.3715	24 59 3.4	5.538	5	21 56 10.55	2.2585	17 54 21.5	11.843
6	20 7 1.63	2.3704	24 53 26.7	5.685	6	21 58 25.97	2.2554	17 42 27.7	11.951
7	20 9 23.82	2.3693	24 47 41.2	5.833	7	22 0 41.20	2.2523	17 30 27.4	12.058
8	20 11 45.95	2.3682	24 41 46.8	5.979	8	22 2 56.25	2.2493	17 18 20.8	12.163
9	20 14 8.00	2.3668	24 35 43.7	6.124	9	22 5 11.12	2.2463	17 6 7.9	12.267
10	20 16 29.97	2.3655	24 29 31.9	6.270	10	22 7 25.80	2.2432	16 53 48.8	12.370
11	20 18 51.86	2.3642	24 23 11.3	6.416	11	22 9 40.30	2.2402	16 41 23.5	12.472
12	20 21 13.67	2.3627	24 16 42.0	6.560	12	22 11 54.62	2.2372	16 28 52.1	12.573
13	20 23 35.38	2.3611	24 10 4.1	6.704	13	22 14 8.76	2.2342	16 16 14.7	12.673
14	20 25 57.00	2.3595	24 3 17.5	6.848	14	22 16 22.72	2.2312	16 3 31.4	12.770
15	20 28 18.52	2.3578	23 56 22.3	6.991	15	22 18 36.50	2.2283	15 50 42.3	12.867
16	20 30 39.93	2.3560	23 49 18.6	7.133	16	22 20 50.11	2.2253	15 37 47.4	12.962
17	20 33 1.24	2.3542	23 42 6.3	7.276	17	22 23 3.54	2.2224	15 24 46.9	13.056
18	20 35 22.43	2.3523	23 34 45.5	7.417	18	22 25 16.80	2.2195	15 11 40.7	13.149
19	20 37 43.51	2.3503	23 27 16.3	7.558	19	22 27 29.88	2.2166	14 58 29.0	13.241
20	20 40 4.47	2.3483	23 19 38.6	7.698	20	22 29 42.79	2.2137	14 45 11.8	13.331
21	20 42 25.30	2.3462	23 11 52.5	7.838	21	22 31 55.52	2.2108	14 31 49.3	13.419
22	20 44 46.01	2.3441	23 3 58.1	7.977	22	22 34 8.09	2.2081	14 18 21.5	13.507
23	20 47 6.59	2.3418	22 55 55.3	8.115	23	22 36 20.49	2.2053	14 4 48.5	13.593
24	20 49 27.03	2.3396	22 47 44.3	8.252	24	22 38 32.72	2.2025	13 51 10.3	13.678
		2.3373	S. 22 39 25.1	8.388			2.1998	S. 13 37 27.1	13.762

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 21.					TUESDAY 23.				
0	22 40 44.79	2.1998	S. 13 37 27.1	13.762	0	0 24 4.11	2.1273	S. 1 28 1.5	16.063
1	22 42 56.70	2.1971	13 23 38.9	13.843	1	0 26 11.75	2.1274	1 11 57.4	16.073
2	22 45 8.44	2.1944	13 9 45.9	13.923	2	0 28 19.40	2.1276	0 55 52.7	16.083
3	22 47 20.03	2.1918	12 55 48.1	14.003	3	0 30 27.06	2.1278	0 39 47.4	16.092
4	22 49 31.46	2.1893	12 41 45.5	14.082	4	0 32 34.74	2.1281	0 23 41.7	16.098
5	22 51 42.74	2.1867	12 27 38.3	14.158	5	0 34 42.43	2.1283	S. 0 7 35.6	16.104
6	22 53 53.86	2.1842	12 13 26.6	14.233	6	0 36 50.14	2.1287	N. 0 8 30.8	16.107
7	22 56 4.84	2.1818	11 59 10.4	14.306	7	0 38 57.88	2.1293	0 24 37.2	16.108
8	22 58 15.67	2.1793	11 44 49.9	14.378	8	0 41 5.65	2.1298	0 40 43.7	16.108
9	23 0 26.35	2.1768	11 30 25.0	14.450	9	0 43 13.46	2.1305	0 56 50.2	16.108
10	23 2 36.89	2.1745	11 15 55.9	14.519	10	0 45 21.31	2.1312	1 12 56.6	16.105
11	23 4 47.29	2.1723	11 1 22.7	14.587	11	0 47 29.20	2.1319	1 29 2.8	16.101
12	23 6 57.56	2.1700	10 46 45.5	14.653	12	0 49 37.14	2.1328	1 45 8.7	16.095
13	23 9 7.69	2.1678	10 32 4.3	14.719	13	0 51 45.14	2.1338	2 1 14.2	16.088
14	23 11 17.69	2.1657	10 17 19.2	14.783	14	0 53 53.19	2.1348	2 17 19.2	16.078
15	23 13 27.57	2.1636	10 2 30.4	14.844	15	0 56 1.31	2.1359	2 33 23.6	16.068
16	23 15 37.32	2.1615	9 47 37.9	14.905	16	0 58 9.50	2.1371	2 49 27.4	16.057
17	23 17 46.95	2.1595	9 32 41.8	14.964	17	1 0 17.76	2.1383	3 5 30.4	16.043
18	23 19 56.46	2.1575	9 17 42.2	15.023	18	1 2 26.09	2.1395	3 21 32.5	16.028
19	23 22 5.85	2.1556	9 2 39.1	15.079	19	1 4 34.50	2.1409	3 37 33.7	16.011
20	23 24 15.13	2.1538	8 47 32.7	15.133	20	1 6 43.00	2.1424	3 53 33.8	15.993
21	23 26 24.30	2.1520	8 32 23.1	15.187	21	1 8 51.59	2.1439	4 9 32.8	15.973
22	23 28 33.37	2.1503	8 17 10.3	15.239	22	1 11 0.27	2.1455	4 25 30.6	15.952
23	23 30 42.33	2.1486	S. 8 1 54.4	15.290	23	1 13 9.05	2.1473	N. 4 41 27.0	15.928
MONDAY 22.					WEDNESDAY 24.				
0	23 32 51.20	2.1470	S. 7 46 35.5	15.338	0	1 15 17.94	2.1490	N. 4 57 22.0	15.904
1	23 34 59.97	2.1454	7 31 13.8	15.386	1	1 17 26.93	2.1508	5 13 15.5	15.878
2	23 37 8.65	2.1439	7 15 49.2	15.433	2	1 19 36.04	2.1528	5 29 7.4	15.851
3	23 39 17.24	2.1425	7 0 21.9	15.477	3	1 21 45.26	2.1547	5 44 57.6	15.822
4	23 41 25.75	2.1412	6 44 52.0	15.520	4	1 23 54.60	2.1568	6 0 46.0	15.791
5	23 43 34.18	2.1398	6 29 19.5	15.562	5	1 26 4.07	2.1589	6 16 32.5	15.759
6	23 45 42.53	2.1385	6 13 44.6	15.601	6	1 28 13.67	2.1611	6 32 17.1	15.726
7	23 47 50.80	2.1373	5 58 7.4	15.639	7	1 30 23.40	2.1633	6 47 59.6	15.690
8	23 49 59.00	2.1362	5 42 27.9	15.677	8	1 32 33.27	2.1657	7 3 39.9	15.653
9	23 52 7.14	2.1352	5 26 46.2	15.712	9	1 34 43.28	2.1681	7 19 18.0	15.615
10	23 54 15.22	2.1342	5 11 2.5	15.746	10	1 36 53.44	2.1706	7 34 53.7	15.575
11	23 56 23.24	2.1333	4 55 16.7	15.779	11	1 39 3.75	2.1732	7 50 27.0	15.534
12	23 58 31.21	2.1324	4 39 29.0	15.810	12	1 41 14.22	2.1758	8 5 57.8	15.491
13	0 0 39.13	2.1316	4 23 39.5	15.839	13	1 43 24.85	2.1785	8 21 25.9	15.446
14	0 2 47.00	2.1308	4 7 48.3	15.867	14	1 45 35.64	2.1813	8 36 51.3	15.400
15	0 4 54.83	2.1302	3 51 55.5	15.893	15	1 47 46.60	2.1841	8 52 13.9	15.352
16	0 7 2.62	2.1296	3 36 1.1	15.918	16	1 49 57.73	2.1869	9 7 33.5	15.303
17	0 9 10.38	2.1291	3 20 5.3	15.942	17	1 52 9.03	2.1899	9 22 50.1	15.252
18	0 11 18.11	2.1287	3 4 8.1	15.964	18	1 54 20.52	2.1930	9 38 3.7	15.199
19	0 13 25.82	2.1283	2 48 9.6	15.984	19	1 56 32.19	2.1961	9 53 14.1	15.145
20	0 15 33.50	2.1279	2 32 10.0	16.003	20	1 58 44.05	2.1993	10 8 21.2	15.090
21	0 17 41.17	2.1277	2 16 9.3	16.020	21	2 0 56.10	2.2025	10 23 24.9	15.032
22	0 19 48.82	2.1275	2 0 7.6	16.037	22	2 3 8.35	2.2058	10 38 25.1	14.973
23	0 21 56.47	2.1274	1 44 4.9	16.051	23	2 5 20.79	2.2091	10 53 21.7	14.913
24	0 24 4.11	2.1273	S. 1 28 1.5	16.063	24	2 7 33.44	2.2126	N. 11 8 14.7	14.852

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 25.					SATURDAY 27.				
0	h m s	s	N. 11 8 14.7	14.852	0	h m s	s	N. 21 20 42.4	10.092
1	2 7 33.44	2.2126	11 23 3.9	14.788	1	3 58 36.23	2.4250	21 30 43.9	9.957
2	2 9 46.30	2.2161	11 37 49.3	14.724	2	4 1 1.87	2.4297	21 40 37.2	9.821
3	2 11 59.37	2.2196	11 52 30.8	14.657	3	4 3 27.79	2.4343	21 50 22.4	9.684
4	2 14 12.65	2.2232	12 7 8.2	14.589	4	4 5 53.99	2.4390	21 59 59.3	9.545
5	2 16 26.15	2.2268	12 21 41.5	14.519	5	4 8 20.47	2.4436	22 9 27.8	9.405
6	2 18 39.87	2.2306	12 36 10.5	14.448	6	4 10 47.22	2.4482	22 18 47.9	9.264
7	2 20 53.82	2.2344	12 50 35.2	14.375	7	4 13 14.25	2.4528	22 27 59.5	9.122
8	2 23 8.00	2.2383	13 4 55.5	14.302	8	4 15 41.55	2.4573	22 37 2.5	8.978
9	2 25 22.41	2.2421	13 19 11.4	14.226	9	4 18 9.12	2.4617	22 45 56.9	8.833
10	2 27 37.05	2.2460	13 33 22.6	14.148	10	4 20 36.95	2.4661	22 54 42.5	8.688
11	2 29 51.93	2.2500	13 47 29.1	14.069	11	4 23 5.05	2.4705	23 3 19.4	8.541
12	2 32 7.05	2.2541	14 1 30.9	13.989	12	4 25 33.41	2.4748	23 11 47.4	8.393
13	2 34 22.42	2.2583	14 15 27.8	13.907	13	4 28 2.03	2.4791	23 20 6.5	8.243
14	2 36 38.04	2.2623	14 29 19.7	13.823	14	4 30 30.90	2.4833	23 28 16.5	8.092
15	2 38 53.90	2.2665	14 43 6.6	13.738	15	4 33 0.02	2.4874	23 36 17.5	7.940
16	2 41 10.02	2.2708	14 56 48.3	13.652	16	4 35 29.39	2.4915	23 44 9.3	7.788
17	2 43 26.39	2.2750	15 10 24.8	13.564	17	4 37 59.00	2.4955	23 51 52.0	7.634
18	2 45 43.02	2.2793	15 23 56.0	13.474	18	4 40 28.85	2.4995	23 59 25.4	7.478
19	2 47 59.91	2.2838	15 37 21.7	13.383	19	4 42 58.94	2.5034	24 6 49.4	7.323
20	2 50 17.07	2.2882	15 50 41.9	13.290	20	4 45 29.26	2.5072	24 14 4.1	7.166
21	2 52 34.49	2.2926	16 3 56.5	13.196	21	4 47 59.80	2.5109	24 21 9.3	7.008
22	2 54 52.18	2.2971	16 17 5.4	13.100	22	4 50 30.57	2.5146	24 28 5.1	6.850
23	2 57 10.14	2.3016	N. 16 30 8.5	13.002	23	4 53 1.55	2.5181	N. 24 34 51.3	6.690
24	2 59 28.37	2.3061				4 55 32.74	2.5216		
FRIDAY 26.					SUNDAY 28.				
0	3 1 46.87	2.3107	N. 16 43 5.7	12.904	0	4 58 4.14	2.5250	N. 24 41 27.9	6.529
1	3 4 5.65	2.3153	16 55 57.0	12.804	1	5 0 35.74	2.5283	24 47 54.8	6.367
2	3 6 24.71	2.3200	17 8 42.2	12.702	2	5 3 7.54	2.5316	24 54 12.0	6.205
3	3 8 44.05	2.3247	17 21 21.2	12.598	3	5 5 39.53	2.5348	25 0 19.4	6.042
4	3 11 3.67	2.3293	17 33 54.0	12.494	4	5 8 11.71	2.5378	25 6 17.0	5.877
5	3 13 23.57	2.3340	17 46 20.5	12.388	5	5 10 44.07	2.5408	25 12 4.7	5.712
6	3 15 43.75	2.3388	17 58 40.5	12.279	6	5 13 16.60	2.5436	25 17 42.5	5.547
7	3 18 4.22	2.3435	18 10 54.0	12.170	7	5 15 49.30	2.5463	25 23 10.3	5.380
8	3 20 24.97	2.3483	18 23 0.9	12.059	8	5 18 22.16	2.5489	25 28 28.1	5.213
9	3 22 46.01	2.3531	18 35 1.1	11.947	9	5 20 55.17	2.5514	25 33 35.9	5.046
10	3 25 7.34	2.3579	18 46 54.5	11.833	10	5 23 28.33	2.5539	25 38 33.6	4.877
11	3 27 28.96	2.3627	18 58 41.1	11.718	11	5 26 1.64	2.5563	25 43 21.1	4.708
12	3 29 50.86	2.3675	19 10 20.7	11.602	12	5 28 35.08	2.5584	25 47 58.5	4.538
13	3 32 13.06	2.3723	19 21 53.3	11.483	13	5 31 8.65	2.5605	25 52 25.7	4.368
14	3 34 35.54	2.3771	19 33 18.7	11.363	14	5 33 42.34	2.5625	25 56 42.7	4.197
15	3 36 58.31	2.3819	19 44 36.9	11.243	15	5 36 16.15	2.5643	26 0 49.4	4.025
16	3 39 21.37	2.3868	19 55 47.8	11.121	16	5 38 50.06	2.5660	26 4 45.7	3.853
17	3 41 44.72	2.3916	20 6 51.4	10.998	17	5 41 24.07	2.5677	26 8 31.8	3.682
18	3 44 8.36	2.3964	20 17 47.5	10.872	18	5 43 58.18	2.5692	26 12 7.5	3.509
19	3 46 32.29	2.4012	20 28 36.0	10.745	19	5 46 32.37	2.5705	26 15 32.9	3.336
20	3 48 56.51	2.4060	20 39 16.9	10.617	20	5 49 6.64	2.5718	26 18 47.8	3.163
21	3 51 21.01	2.4108	20 49 50.0	10.488	21	5 51 40.98	2.5728	26 21 52.4	2.989
22	3 53 45.80	2.4155	21 0 15.4	10.358	22	5 54 15.38	2.5738	26 24 46.5	2.814
23	3 56 10.87	2.4203	21 10 32.9	10.225	23	5 56 49.84	2.5748	26 27 30.1	2.640
24	3 58 36.23	2.4250	N. 21 20 42.4	10.092	24	5 59 24.35	2.5755	N. 26 30 3.3	2.466

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 29.					WEDNESDAY 31.				
0	h m 24.35	2.5755	N. 26 30 3.3	2.466	0	h m 18.94	2.4564	N. 25 10 30.0	5.572
1	6 1 58.90	2.5760	26 32 26.0	2.291	1	8 3 46.17	2.4512	25 4 51.2	5.720
2	6 4 33.47	2.5764	26 34 38.2	2.116	2	8 6 13.08	2.4459	24 59 3.6	5.867
3	6 7 8.07	2.5767	26 36 39.9	1.941	3	8 8 39.68	2.4406	24 53 7.2	6.013
4	6 9 42.68	2.5769	26 38 31.1	1.766	4	8 11 5.95	2.4351	24 47 2.0	6.158
5	6 12 17.30	2.5770	26 40 11.8	1.591	5	8 13 31.89	2.4296	24 40 48.2	6.302
6	6 14 51.92	2.5769	26 41 42.0	1.416	6	8 15 57.50	2.4240	24 34 25.8	6.445
7	6 17 26.53	2.5767	26 43 1.7	1.240	7	8 18 22.77	2.4184	24 27 54.8	6.587
8	6 20 1.12	2.5763	26 44 10.8	1.064	8	8 20 47.71	2.4128	24 21 15.4	6.726
9	6 22 35.69	2.5758	26 45 9.4	0.889	9	8 23 12.30	2.4070	24 14 27.7	6.864
10	6 25 10.22	2.5752	26 45 57.5	0.714	10	8 25 36.55	2.4012	24 7 31.7	7.002
11	6 27 44.71	2.5744	26 46 35.1	0.538	11	8 28 0.44	2.3953	24 0 27.4	7.139
12	6 30 19.15	2.5735	26 47 2.1	0.363	12	8 30 23.98	2.3893	23 53 15.0	7.274
13	6 32 53.53	2.5724	26 47 18.7	0.189	13	8 32 47.16	2.3834	23 45 54.5	7.407
14	6 35 27.84	2.5712	26 47 24.8	+0.015	14	8 35 9.99	2.3774	23 38 26.1	7.539
15	6 38 2.08	2.5699	26 47 20.5	-0.159	15	8 37 32.45	2.3713	23 30 49.8	7.670
16	6 40 36.23	2.5684	26 47 5.7	0.333	16	8 39 54.54	2.3652	23 23 5.7	7.799
17	6 43 10.29	2.5668	26 46 40.5	0.507	17	8 42 16.27	2.3591	23 15 13.9	7.928
18	6 45 44.25	2.5651	26 46 4.9	0.680	18	8 44 37.63	2.3529	23 7 14.4	8.055
19	6 48 18.10	2.5633	26 45 18.9	0.853	19	8 46 58.62	2.3467	22 59 7.3	8.181
20	6 50 51.84	2.5613	26 44 22.6	1.025	20	8 49 19.23	2.3403	22 50 52.7	8.304
21	6 53 25.45	2.5591	26 43 15.9	1.198	21	8 51 39.46	2.3341	22 42 30.8	8.427
22	6 55 58.93	2.5569	26 41 58.9	1.369	22	8 53 59.32	2.3278	22 34 1.5	8.548
23	6 58 32.28	2.5545	N. 26 40 31.6	1.540	23	8 56 18.80	2.3215	N. 22 25 25.0	8.668
TUESDAY 30.					THURSDAY, SEPTEMBER 1.				
0	7 1 5.47	2.5519	N. 26 38 54.1	1.710	0	8 58 37.90	2.3152	N. 22 16 41.3	8.787
1	7 3 38.51	2.5492	26 37 6.4	1.880	PHASES OF THE MOON.				
2	7 6 11.38	2.5464	26 35 8.5	2.050					
3	7 8 44.08	2.5435	26 33 0.4	2.219					
4	7 11 16.60	2.5405	26 30 42.2	2.387					
5	7 13 48.94	2.5373	26 28 14.0	2.553					
6	7 16 21.08	2.5340	26 25 35.8	2.720					
7	7 18 53.02	2.5307	26 22 47.6	2.887					
8	7 21 24.76	2.5272	26 19 49.4	3.053					
9	7 23 56.29	2.5236	26 16 41.3	3.217					
10	7 26 27.59	2.5198	26 13 23.4	3.380					
11	7 28 58.66	2.5159	26 9 55.7	3.543	● New Moon . . . . . Aug. 4 18 36.8	d h m			
12	7 31 29.50	2.5120	26 6 18.3	3.704	☾ First Quarter . . . . . 12 14 1.1	12 14 1.1			
13	7 34 0.10	2.5078	26 2 31.2	3.866	○ Full Moon . . . . . 20 7 14.1	20 7 14.1			
14	7 36 30.44	2.5036	25 58 34.4	4.026	☾ Last Quarter . . . . . 27 2 33.2	27 2 33.2			
15	7 39 0.53	2.4993	25 54 28.1	4.185					
16	7 41 30.36	2.4950	25 50 12.2	4.343					
17	7 43 59.93	2.4905	25 45 46.9	4.500					
18	7 46 29.22	2.4859	25 41 12.2	4.657					
19	7 48 58.24	2.4812	25 36 28.1	4.812					
20	7 51 26.97	2.4764	25 31 34.8	4.965	☾ Apogee . . . . . Aug. 12 6.6	d h			
21	7 53 55.41	2.4715	25 26 32.3	5.118	☾ Perigee . . . . . 24 13.2	24 13.2			
22	7 56 23.55	2.4666	25 21 20.6	5.271					
23	7 58 51.40	2.4616	25 15 59.8	5.422					
24	8 1 18.94	2.4564	N. 25 10 30.0	5.572					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
1	Fomalhaut	W.	106 17 16	2472	107 59 8	2479	109 40 51	2486	111 22 24	2493
	α Pegasi	W.	86 32 22	2671	88 9 40	2673	89 46 56	2676	91 24 9	2680
	SATURN	W.	43 12 56	2291	44 59 8	2294	46 45 16	2297	48 31 21	2300
	SUN	E.	49 4 40	2614	47 26 4	2618	45 47 33	2623	44 9 9	2629
2	α Pegasi	W.	99 28 29	2713	101 4 52	2723	102 41 2	2734	104 16 57	2746
	SATURN	W.	57 20 29	2319	59 6 1	2324	60 51 25	2329	62 36 42	2335
	SUN	E.	35 59 14	2664	34 21 46	2674	32 44 31	2684	31 7 30	2696
7	SUN	W.	27 43 44	3128	29 11 20	3136	30 38 46	3145	32 6 1	3155
	Antares	E.	87 29 24	2725	85 53 18	2739	84 17 30	2752	82 41 59	2766
8	SUN	W.	39 19 13	3209	40 45 12	3220	42 10 58	3231	43 36 31	3242
	Antares	E.	74 48 44	2830	73 14 55	2843	71 41 23	2855	70 8 6	2867
	α Aquilæ	E.	118 34 0	3924	117 21 5	3908	116 7 53	3891	114 54 24	3876
9	SUN	W.	50 40 56	3297	52 5 10	3307	53 29 13	3318	54 53 4	3328
	Antares	E.	62 25 31	2924	60 53 44	2935	59 22 10	2946	57 50 50	2957
	α Aquilæ	E.	108 43 58	3832	107 29 29	3827	106 14 55	3823	105 0 17	3820
10	SUN	W.	61 49 30	3374	63 12 16	3382	64 34 53	3389	65 57 22	3396
	Antares	E.	50 17 15	3003	48 47 7	3012	47 17 9	3020	45 47 21	3028
	α Aquilæ	E.	98 46 44	3820	97 32 3	3822	96 17 25	3825	95 2 49	3828
11	SUN	W.	72 47 51	3427	74 9 37	3431	75 31 18	3435	76 52 54	3438
	JUPITER	W.	19 33 37	3132	21 1 8	3133	22 28 37	3135	23 56 4	3136
	Antares	E.	38 20 37	3062	36 51 41	3068	35 22 52	3073	33 54 10	3078
	α Aquilæ	E.	88 50 51	3853	87 36 43	3859	86 22 42	3866	85 8 48	3873
12	SUN	W.	83 40 4	3450	85 1 23	3451	86 22 42	3452	87 44 0	3451
	JUPITER	W.	31 13 3	3140	32 40 24	3139	34 7 46	3139	35 35 8	3138
	Spica	W.	20 11 25	3180	21 37 58	3169	23 4 44	3158	24 31 43	3148
	Antares	E.	26 32 11	3103	25 4 5	3109	23 36 6	3115	22 8 14	3121
	α Aquilæ	E.	79 1 17	3917	77 48 14	3927	76 35 22	3938	75 22 41	3949
	Fomalhaut	E.	109 2 37	3259	107 27 37	3257	106 12 35	3255	104 47 31	3252
13	SUN	W.	94 30 48	3442	95 52 17	3439	97 13 49	3435	98 35 26	3431
	JUPITER	W.	42 52 28	3127	44 20 4	3123	45 47 45	3119	47 15 31	3115
	Spica	W.	31 49 25	3108	33 17 25	3101	34 45 33	3094	36 13 50	3087
	α Aquilæ	E.	69 22 25	4022	68 11 6	4038	67 0 4	4056	65 49 19	4076
	Fomalhaut	E.	97 41 13	3235	96 15 45	3231	94 50 12	3226	93 24 33	3221
	α Pegasi	E.	116 11 4	3544	114 51 28	3529	113 31 36	3515	112 11 29	3501
14	SUN	W.	105 24 53	3401	106 47 7	3394	108 9 30	3387	109 32 1	3379
	JUPITER	W.	54 35 51	3086	56 4 17	3079	57 32 52	3072	59 1 36	3064
	Spica	W.	43 37 27	3049	45 6 39	3041	46 36 1	3032	48 5 34	3023
	α Aquilæ	E.	60 0 58	4201	58 52 33	4232	57 44 38	4266	56 37 14	4304
	Fomalhaut	E.	86 14 53	3194	84 48 37	3189	83 22 15	3183	81 55 45	3176
	α Pegasi	E.	105 27 7	3437	104 5 32	3424	102 43 43	3412	101 21 40	3400
15	SUN	W.	116 27 2	3333	117 50 35	3323	119 14 20	3313	120 38 17	3302
	JUPITER	W.	66 27 49	3019	67 57 38	3009	69 27 40	2998	70 57 55	2987

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
1	Fomalhaut W.	113 3 46	2503	114 44 56	2513	116 25 51	2524	118 6 31	2536
	α Pegasi W.	93 1 16	2684	94 38 17	2690	96 15 10	2697	97 51 54	2704
	SATURN W.	50 17 21	2303	52 3 16	2307	53 49 6	2311	55 34 50	2315
	SUN E.	42 30 53	2634	40 52 44	2640	39 14 44	2647	37 36 54	2655
2	α Pegasi W.	105 52 37	2759	107 27 59	2773	109 3 2	2788	110 37 45	2806
	SATURN W.	64 21 50	2341	66 6 50	2347	67 51 41	2353	69 36 23	2359
	SUN E.	29 30 45	2710	27 54 18	2724	26 18 10	2740	24 42 23	2758
7	SUN W.	33 33 4	3165	34 59 55	3175	36 26 34	3186	37 53 0	3197
	Antares E.	81 6 46	2779	79 31 50	2792	77 57 11	2805	76 22 49	2818
8	SUN W.	45 1 50	3253	46 26 56	3265	47 51 49	3276	49 16 29	3287
	Antares E.	68 35 5	2879	67 2 19	2891	65 29 49	2902	63 57 33	2913
	α Aquilæ E.	113 40 40	3864	112 26 44	3854	111 12 37	3845	109 58 21	3838
9	SUN W.	56 16 43	3338	57 40 11	3347	59 3 28	3356	60 26 34	3365
	Antares E.	56 19 43	2967	54 48 49	2976	53 18 6	2985	51 47 35	2993
	α Aquilæ E.	103 45 36	3819	102 30 53	3819	101 16 10	3819	100 1 27	3819
10	SUN W.	67 19 43	3403	68 41 56	3410	70 4 1	3416	71 25 59	3422
	Antares E.	44 17 43	3035	42 48 14	3042	41 18 53	3049	39 49 41	3056
	α Aquilæ E.	93 48 16	3832	92 33 47	3837	91 19 23	3842	90 5 4	3848
11	SUN W.	78 14 27	3442	79 35 56	3445	80 57 21	3448	82 18 43	3449
	JUPITER W.	25 23 30	3137	26 50 54	3138	28 18 18	3138	29 45 41	3139
	Antares E.	32 25 34	3083	30 57 4	3088	29 28 40	3093	28 0 22	3098
	α Aquilæ E.	83 55 1	3881	82 41 22	3889	81 27 51	3898	80 14 29	3908
12	SUN W.	89 5 19	3450	90 26 39	3449	91 47 59	3447	93 9 22	3445
	JUPITER W.	37 2 32	3136	38 29 57	3134	39 57 25	3132	41 24 55	3130
	Spica W.	25 58 55	3139	27 26 18	3130	28 53 51	3122	30 21 34	3115
	Antares E.	20 40 30	3129	19 12 56	3138	17 45 32	3148	16 18 20	3159
	α Aquilæ E.	74 10 11	3961	72 57 53	3975	71 45 49	3990	70 33 59	4006
	Fomalhaut E.	103 22 23	3249	101 57 11	3246	100 31 56	3242	99 6 37	3238
13	SUN W.	99 57 7	3426	101 18 54	3421	102 40 47	3415	104 2 46	3408
	JUPITER W.	48 43 22	3110	50 11 19	3105	51 39 22	3099	53 7 33	3093
	Spica W.	37 42 15	3080	39 10 49	3073	40 39 32	3065	42 8 25	3057
	α Aquilæ E.	64 38 54	4098	63 28 50	4121	62 19 8	4145	61 9 50	4172
	Fomalhaut E.	91 58 49	3216	90 32 59	3212	89 7 4	3206	87 41 2	3200
	α Pegasi E.	110 51 6	3488	109 30 28	3475	108 9 36	3462	106 48 29	3449
14	SUN W.	110 54 41	3371	112 17 30	3362	113 40 30	3353	115 3 40	3343
	JUPITER W.	60 30 29	3056	61 59 32	3047	63 28 46	3038	64 58 12	3029
	Spica W.	49 35 19	3014	51 5 15	3004	52 35 22	2994	54 5 42	2984
	α Aquilæ E.	55 30 25	4344	54 24 13	4389	53 18 42	4438	52 13 55	4493
	Fomalhaut E.	80 29 7	3169	79 2 21	3163	77 35 28	3156	76 8 27	3149
	α Pegasi E.	99 59 23	3388	98 36 53	3377	97 14 10	3365	95 51 13	3353
15	SUN W.	122 2 27	3290	123 26 50	3279	124 51 26	3267	126 16 16	3255
	JUPITER W.	72 28 24	2976	73 59 7	2965	75 30 4	2953	77 1 16	2941

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
15	Spica W.	55 36 14	2974	57 6 59	2963	58 37 58	2952	60 9 10	2941
	Fomalhaut E.	74 41 17	3143	73 13 59	3136	71 46 33	3129	70 18 59	3122
	α Pegasi E.	94 28 3	3342	93 4 40	3331	91 41 5	3320	90 17 17	3309
16	JUPITER W.	78 32 43	2928	80 4 26	2916	81 36 24	2903	83 8 39	2890
	Spica W.	67 48 55	2881	69 21 38	2868	70 54 38	2855	72 27 55	2842
	Antares W.	21 58 0	2912	23 30 3	2894	25 2 29	2877	26 35 17	2860
	Fomalhaut E.	62 59 3	3090	61 30 40	3084	60 2 11	3079	58 33 36	3074
	α Pegasi E.	83 15 11	3258	81 50 10	3249	80 24 59	3240	78 59 37	3231
17	JUPITER W.	90 54 10	2822	92 28 9	2808	94 2 27	2794	95 37 3	2780
	Spica W.	80 18 40	2774	81 53 42	2760	83 29 3	2746	85 4 43	2732
	Antares W.	34 24 37	2780	35 59 31	2765	37 34 45	2750	39 10 19	2735
	Fomalhaut E.	51 9 30	3062	49 40 34	3063	48 11 39	3066	46 42 47	3070
	α Pegasi E.	71 50 23	3196	70 24 8	3191	68 57 47	3186	67 31 21	3182
	SATURN E.	113 18 21	2761	111 43 2	2747	110 7 24	2733	108 31 27	2719
	α Arietis E.	113 41 24	2862	112 8 16	2846	110 34 48	2831	109 0 58	2814
18	JUPITER W.	103 34 43	2708	105 11 12	2694	106 48 0	2680	108 25 8	2666
	Spica W.	93 7 44	2660	94 45 18	2646	96 23 10	2632	98 1 22	2618
	Antares W.	47 13 14	2659	48 50 49	2644	50 28 45	2629	52 7 1	2615
	α Pegasi E.	60 18 34	3183	58 52 4	3187	57 25 39	3193	55 59 22	3202
	SATURN E.	100 27 0	2647	98 49 9	2633	97 10 59	2618	95 32 29	2604
	α Arietis E.	101 6 42	2736	99 30 50	2721	97 54 37	2706	96 18 5	2691
19	Spica W.	106 17 4	2550	107 57 8	2537	109 37 30	2524	111 18 10	2511
	Antares W.	60 23 14	2543	62 3 27	2530	63 43 58	2516	65 24 49	2503
	SATURN E.	87 15 11	2535	85 34 46	2522	83 54 3	2508	82 13 1	2495
	α Arietis E.	88 10 34	2621	86 32 8	2608	84 53 24	2595	83 14 22	2583
	Aldebaran E.	118 37 16	2573	116 57 44	2558	115 17 51	2544	113 37 39	2530
20	Antares W.	73 53 35	2441	75 36 12	2429	77 19 6	2417	79 2 16	2406
	SATURN E.	73 43 22	2433	72 0 35	2422	70 17 31	2410	68 34 11	2399
	α Arietis E.	74 55 8	2527	73 14 32	2517	71 33 42	2507	69 52 39	2498
	Aldebaran E.	105 11 58	2465	103 29 55	2453	101 47 36	2442	100 5 1	2430
21	Antares W.	87 41 54	2356	89 26 32	2347	91 11 23	2339	92 56 27	2331
	α Aquilæ W.	48 38 46	2408	49 49 38	2395	51 2 6	2383	52 16 3	2373
	SATURN E.	59 53 42	2349	58 8 54	2340	56 23 53	2332	54 38 40	2323
	α Arietis E.	61 24 34	2464	59 42 30	2459	58 0 18	2455	56 18 1	2451
	Aldebaran E.	91 28 12	2380	89 44 8	2371	87 59 51	2362	86 15 22	2354
22	Antares W.	101 44 32	2295	103 30 39	2289	105 16 54	2284	107 3 17	2279
	α Aquilæ W.	58 44 42	2471	60 5 38	2474	61 27 27	2480	62 50 6	2489
	SATURN E.	45 49 43	2288	44 3 26	2282	42 17 0	2277	40 30 27	2272
	α Arietis E.	47 45 58	2453	46 3 38	2457	44 21 23	2462	42 39 16	2470
	Aldebaran E.	77 30 14	2320	75 44 44	2315	73 59 7	2310	72 13 22	2305
	Pollux E.	121 32 51	2293	119 46 41	2287	118 0 23	2281	116 13 56	2276
23	α Aquilæ W.	69 53 42	3188	71 20 6	3165	72 46 57	3145	74 14 12	3127
	Fomalhaut W.	35 54 29	2783	37 29 19	2739	39 5 7	2700	40 41 48	2666
	SATURN E.	31 35 58	2252	29 48 48	2250	28 1 35	2248	26 14 19	2247



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
15	Spica W.	61 40 37	2929	63 12 19	2917	64 44 15	2905	66 16 27	2893
	Fomalhaut E.	68 51 16	3115	67 23 25	3108	65 55 25	3102	64 27 18	3096
	$\alpha$ Pegasi E.	88 53 16	3299	87 29 3	3288	86 4 38	3278	84 40 0	3268
16	JUPITER W.	84 41 11	2876	86 14 0	2863	87 47 6	2850	89 20 29	2836
	Spica W.	74 1 29	2828	75 35 20	2815	77 9 29	2801	78 43 56	2788
	Antares W.	28 8 27	2844	29 41 58	2828	31 15 50	2811	32 50 3	2795
	Fomalhaut E.	57 4 55	3070	55 36 9	3067	54 7 19	3065	52 38 25	3063
	$\alpha$ Pegasi E.	77 34 4	3223	76 8 21	3215	74 42 30	3208	73 16 30	3202
17	JUPITER W.	97 11 57	2766	98 47 10	2751	100 22 42	2737	101 58 33	2722
	Spica W.	86 40 41	2717	88 16 58	2703	89 53 34	2689	91 30 30	2675
	Antares W.	40 46 13	2719	42 22 28	2704	43 59 3	2689	45 35 58	2674
	Fomalhaut E.	45 14 0	3076	43 45 21	3084	42 16 52	3095	40 48 36	3110
	$\alpha$ Pegasi E.	66 4 50	3180	64 38 17	3179	63 11 42	3178	61 45 7	3180
	SATURN E.	106 55 12	2704	105 18 37	2690	103 41 44	2676	102 4 32	2661
	$\alpha$ Arietis E.	107 26 48	2798	105 52 17	2782	104 17 26	2766	102 42 14	2751
18	JUPITER W.	110 2 34	2652	111 40 19	2638	113 18 23	2624	114 56 47	2610
	Spica W.	99 39 53	2604	101 18 43	2591	102 57 51	2577	104 37 18	2563
	Antares W.	53 45 36	2600	55 24 31	2586	57 3 46	2571	58 43 20	2557
	$\alpha$ Pegasi E.	54 33 15	3213	53 7 21	3227	51 41 44	3244	50 16 27	3265
	SATURN E.	93 53 40	2590	92 14 31	2576	90 35 4	2562	88 55 17	2548
	$\alpha$ Arietis E.	94 41 13	2677	93 4 2	2663	91 26 31	2649	89 48 42	2635
19	Spica W.	112 59 8	2499	114 40 23	2487	116 21 55	2475	118 3 44	2462
	Antares W.	67 5 58	2490	68 47 25	2477	70 29 11	2465	72 11 14	2453
	SATURN E.	80 31 41	2482	78 50 3	2470	77 8 7	2457	75 25 53	2445
	$\alpha$ Arietis E.	81 35 3	2571	79 55 27	2559	78 15 36	2548	76 35 29	2538
	Aldebaran E.	111 57 8	2517	110 16 18	2504	108 35 10	2490	106 53 43	2477
20	Antares W.	80 45 42	2396	82 29 23	2385	84 13 19	2375	85 57 29	2365
	SATURN E.	66 50 35	2389	65 6 44	2378	63 22 38	2368	61 38 17	2358
	$\alpha$ Arietis E.	68 11 23	2490	66 29 56	2482	64 48 18	2476	63 6 30	2470
	Aldebaran E.	98 22 9	2419	96 39 2	2409	94 55 40	2399	93 12 3	2389
21	Antares W.	94 41 42	2322	96 27 9	2315	98 12 46	2308	99 58 34	2301
	$\alpha$ Aquilæ W.	53 31 23	3709	54 48 0	3642	56 5 49	3581	57 24 44	3524
	SATURN E.	52 53 14	2315	51 7 37	2308	49 21 49	2301	47 35 51	2294
	$\alpha$ Arietis E.	54 35 39	2449	52 53 14	2448	51 10 48	2449	49 28 22	2450
	Aldebaran E.	84 30 41	2346	82 45 49	2339	81 0 47	2333	79 15 35	2326
22	Antares W.	108 49 48	2274	110 36 26	2270	112 23 9	2266	114 9 58	2263
	$\alpha$ Aquilæ W.	64 13 32	3303	65 37 40	3270	67 2 26	3240	68 27 48	3213
	SATURN E.	38 43 46	2267	36 56 58	2263	35 10 4	2259	33 23 4	2255
	$\alpha$ Arietis E.	40 57 21	2480	39 15 40	2492	37 34 15	2507	35 53 11	2527
	Aldebaran E.	70 27 30	2301	68 41 32	2298	66 55 30	2295	65 9 23	2293
	Pollux E.	114 27 21	2271	112 40 39	2266	110 53 50	2262	109 6 55	2259
23	$\alpha$ Aquilæ W.	75 41 49	3111	77 9 45	3097	78 37 58	3085	80 6 26	3076
	Fomalhaut W.	42 19 14	2636	43 57 21	2610	45 36 3	2587	47 15 16	2566
	SATURN E.	24 27 1	2246	22 39 42	2245	20 52 21	2245	19 5 0	2244

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
23	Aldebaran E.	63 23 13	2291	61 37 0	2289	59 50 44	2288	58 4 26	2287
	Pollux E.	107 19 55	2256	105 32 50	2253	103 45 40	2250	101 58 27	2248
24	$\alpha$ Aquilæ W.	81 35 5	3068	83 3 54	3061	84 32 52	3056	86 1 56	3053
	Fomalhaut W.	48 54 58	2548	50 35 4	2532	52 15 32	2518	53 56 20	2506
	$\alpha$ Pegasi W.	34 35 53	3593	35 52 48	3571	37 11 54	3464	38 32 58	3370
	Aldebaran E.	49 13 5	2294	47 26 56	2297	45 40 52	2300	43 54 53	2305
	Pollux E.	93 1 40	2242	91 14 15	2241	89 26 49	2242	87 39 24	2242
	SUN E.	131 6 52	2570	129 27 16	2569	127 47 38	2568	126 7 59	2567
25	$\alpha$ Aquilæ W.	93 27 27	3062	94 56 23	3069	96 25 11	3077	97 53 49	3086
	Fomalhaut W.	62 23 51	2467	64 5 51	2462	65 47 58	2458	67 30 10	2455
	$\alpha$ Pegasi W.	45 41 16	3050	47 10 27	3006	48 40 32	2968	50 11 25	2934
	Aldebaran E.	35 7 9	2344	33 22 13	2355	31 37 34	2369	29 53 15	2386
	Pollux E.	78 42 35	2249	76 55 20	2251	75 8 8	2253	73 20 59	2256
	SUN E.	117 49 41	2570	116 10 5	2572	114 30 31	2574	112 50 59	2576
26	$\alpha$ Aquilæ W.	105 13 21	3161	106 40 17	3181	108 6 48	3204	109 32 52	3229
	Fomalhaut W.	76 1 50	2452	77 44 11	2453	79 26 31	2455	81 8 48	2457
	$\alpha$ Pegasi W.	57 55 9	2814	59 29 19	2798	61 3 49	2784	62 38 38	2772
	SATURN W.	11 26 32	2283	13 12 57	2283	14 59 22	2283	16 45 47	2284
	Pollux E.	64 26 18	2272	62 39 37	2275	60 53 1	2279	59 6 31	2283
	SUN E.	104 34 14	2591	102 55 6	2594	101 16 3	2598	99 37 5	2602
27	Fomalhaut W.	89 39 16	2475	91 21 5	2480	93 2 46	2485	94 44 20	2490
	$\alpha$ Pegasi W.	70 36 1	2734	72 11 56	2730	73 47 56	2727	75 24 0	2725
	$\alpha$ Arietis W.	26 58 16	2722	28 34 27	2687	30 11 25	2655	31 49 6	2627
	SATURN W.	25 37 0	2300	27 22 59	2304	29 8 52	2309	30 54 39	2313
	Pollux E.	50 15 34	2307	48 29 44	2311	46 44 1	2316	44 58 25	2322
	SUN E.	91 23 43	2625	89 45 22	2630	88 7 7	2635	86 28 59	2640
28	Fomalhaut W.	103 9 59	2586	104 50 35	2535	106 31 0	2544	108 11 12	2553
	$\alpha$ Pegasi W.	83 24 31	2730	85 0 31	2734	86 36 26	2738	88 12 16	2742
	$\alpha$ Arietis W.	40 5 10	2544	41 45 22	2538	43 25 43	2532	45 6 12	2527
	SATURN W.	39 41 53	2337	41 26 58	2343	43 11 55	2348	44 56 45	2353
	SUN E.	78 20 13	2669	76 42 51	2675	75 5 38	2681	73 28 33	2687
29	$\alpha$ Pegasi W.	96 9 31	2778	97 44 28	2787	99 19 13	2797	100 53 45	2808
	SATURN W.	53 38 52	2382	55 22 53	2388	57 6 44	2394	58 50 27	2400
	$\alpha$ Arietis W.	53 29 52	2517	55 10 41	2518	56 51 29	2520	58 32 15	2521
	Aldebaran W.	22 56 48	2583	24 36 7	2566	26 15 49	2552	27 55 50	2542
	SUN E.	65 25 17	2721	63 49 5	2728	62 13 3	2735	60 37 10	2743
30	SATURN W.	67 26 49	2433	69 9 37	2439	70 52 16	2446	72 34 45	2453
	$\alpha$ Arietis W.	66 55 13	2538	68 35 34	2543	70 15 48	2547	71 55 56	2552
	Aldebaran W.	36 18 20	2524	37 59 0	2524	39 39 40	2525	41 20 18	2527
	SUN E.	52 40 16	2782	51 5 25	2791	49 30 45	2799	47 56 16	2808
31	SATURN W.	81 4 42	2489	82 46 10	2497	84 27 28	2504	86 8 35	2512
	$\alpha$ Arietis W.	80 14 40	2583	81 53 59	2590	83 33 8	2597	85 12 7	2604
	Aldebaran W.	49 42 24	2548	51 22 31	2553	53 2 31	2558	54 42 24	2564
	SUN E.	40 6 54	2858	38 33 41	2869	37 0 41	2880	35 27 56	2892

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
23	Aldebaran E. Pollux E.	56 18 8 100 11 10	2287 2246	54 31 50 98 23 51	2283 2244	52 45 33 96 36 29	2239 2243	50 59 18 94 49 5	2291 2242
24	α Aquilæ W. Fomalhaut W. α Pegasi W. Aldebaran E. Pollux E. SUN E.	87 31 2 55 37 24 39 55 49 42 9 1 85 51 59 124 28 19	3052 2496 3288 2311 2243 2567	89 0 10 57 18 43 41 20 14 40 23 17 84 4 35 122 48 39	3052 2487 3218 2317 2244 2567	90 29 19 59 0 15 42 46 2 38 37 43 82 17 13 121 8 59	3054 2479 3155 2325 2245 2567	91 58 25 60 41 59 44 13 5 36 52 20 80 29 53 119 29 19	3057 2472 3099 2334 2247 2567
25	α Aquilæ W. Fomalhaut W. α Pegasi W. Aldebaran E. Pollux E. SUN E.	99 22 16 69 12 26 51 43 1 28 9 21 71 33 54 111 11 31	3097 2453 2904 2406 2258 2578	100 50 29 70 54 45 53 15 15 26 25 55 69 46 53 109 32 6	3111 2452 2876 2429 2261 2581	102 18 25 72 37 6 54 48 4 24 43 2 67 59 56 107 52 45	3126 2452 2853 2457 2265 2584	103 46 3 74 19 28 56 21 23 23 0 48 66 13 5 106 13 27	3143 2452 2832 2488 2268 2587
26	α Aquilæ W. Fomalhaut W. α Pegasi W. SATURN W. Pollux E. SUN E.	110 58 27 82 51 3 64 13 43 18 32 10 57 20 6 97 58 13	3257 2459 2761 2286 2287 2606	112 23 30 84 33 14 65 49 2 20 18 30 55 33 48 96 19 27	3287 2462 2752 2289 2291 2610	113 47 57 86 15 19 67 24 32 22 4 45 53 47 36 94 40 46	3319 2466 2745 2293 2296 2615	115 11 47 87 57 20 69 0 12 23 50 55 52 1 31 93 2 11	3352 2470 2739 2296 2302 2620
27	Fomalhaut W. α Pegasi W. α Arietis W. SATURN W. Pollux E. SUN E.	96 25 47 77 0 7 33 27 26 32 40 20 43 12 57 84 50 59	2497 2724 2603 2317 2327 2646	98 7 3 78 36 15 35 6 17 34 25 54 41 27 37 83 13 6	2504 2725 2384 2322 2333 2652	99 48 13 80 12 22 36 45 33 36 11 21 39 42 25 81 35 21	2511 2726 2568 2327 2339 2657	101 29 11 81 48 27 38 25 12 37 56 41 37 57 22 79 57 43	2518 2727 2554 2332 2346 2663
28	Fomalhaut W. α Pegasi W. α Arietis W. SATURN W. SUN E.	109 51 11 89 48 0 46 46 48 46 41 27 71 51 36	2564 2748 2522 2359 2694	111 30 56 91 23 36 48 27 30 48 26 1 70 14 48	2574 2754 2520 2365 2701	113 10 26 92 59 4 50 8 15 50 10 26 68 38 9	2585 2761 2518 2371 2707	114 49 41 94 34 23 51 49 3 51 54 43 67 1 39	2598 2769 2517 2376 2714
29	α Pegasi W. SATURN W. α Arietis W. Aldebaran W. SUN E.	102 28 2 60 34 2 60 12 59 29 36 5 59 1 27	2820 2406 2524 2535 2750	104 2 4 62 17 28 61 53 39 31 16 30 57 25 54	2832 2413 2527 2530 2758	105 35 50 64 0 44 63 34 15 32 57 3 55 50 31	2845 2419 2530 2526 2766	107 9 19 65 43 51 65 14 47 34 37 40 54 15 18	2860 2426 2534 2584 2774
30	SATURN W. α Arietis W. Aldebaran W. SUN E.	74 17 5 73 35 57 43 0 53 46 21 59	2460 2558 2530 2818	75 59 15 75 15 50 44 41 24 44 47 54	2467 2564 2534 2827	77 41 14 76 55 35 46 21 50 43 14 1	2475 2570 2538 2837	79 23 3 78 35 12 48 2 10 41 40 21	2482 2576 2543 2847
31	SATURN W. α Arietis W. Aldebaran W. SUN E.	87 49 31 86 50 57 56 22 8 33 55 26	2520 2612 2570 2905	89 30 16 88 29 36 58 1 44 32 23 12	2528 2620 2577 2918	91 10 50 90 8 4 59 41 10 30 51 16	2536 2628 2584 2932	92 51 13 91 46 21 61 20 27 29 19 38	2544 2636 2591 2946

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Added to		Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Subtracted from Apparent Time.				
		h m s	s	° ' "	"	' "	s	m s	s		
Thur.	1	10 39 13.82	9.081	N. 8 31 0.4	-54.25	15 52.92	64.40	0 9.06	0.773		
Frid.	2	10 42 51.61	9.069	8 9 14.4	54.59	15 53.15	64.35	0 9.65	0.786		
Sat.	3	10 46 29.12	9.057	7 47 20.5	54.91	15 53.38	64.31	0 28.65	0.797		
SUN.	4	10 50 6.37	9.046	7 25 19.1	-55.22	15 53.61	64.27	0 47.91	0.808		
Mon.	5	10 53 43.35	9.035	7 3 10.4	55.51	15 53.85	64.23	1 7.43	0.818		
Tues.	6	10 57 20.07	9.025	6 40 54.8	55.79	15 54.09	64.20	1 27.19	0.828		
Wed.	7	11 0 56.57	9.015	6 18 32.6	-56.06	15 54.34	64.17	1 47.19	0.838		
Thur.	8	11 4 32.86	9.007	5 56 4.2	56.31	15 54.59	64.14	2 7.41	0.847		
Frid.	9	11 8 8.95	9.000	5 33 30.0	56.54	15 54.84	64.11	2 27.82	0.855		
Sat.	10	11 11 44.86	8.992	5 10 50.2	-56.76	15 55.09	64.09	2 48.41	0.862		
SUN.	11	11 15 20.60	8.987	4 48 5.3	56.97	15 55.35	64.07	3 9.17	0.868		
Mon.	12	11 18 56.20	8.982	4 25 15.6	57.17	15 55.60	64.05	3 30.06	0.873		
Tues.	13	11 22 31.68	8.977	4 2 21.3	-57.35	15 55.86	64.04	3 51.07	0.878		
Wed.	14	11 26 7.06	8.972	3 39 22.9	57.52	15 56.12	64.03	4 12.19	0.882		
Thur.	15	11 29 42.35	8.969	3 16 20.6	57.67	15 56.38	64.02	4 33.39	0.885		
Frid.	16	11 33 17.58	8.967	2 53 14.9	-57.81	15 56.64	64.01	4 54.65	0.887		
Sat.	17	11 36 52.77	8.966	2 30 6.0	57.94	15 56.91	64.01	5 15.95	0.888		
SUN.	18	11 40 27.95	8.966	2 6 54.1	58.05	15 57.17	64.01	5 37.27	0.888		
Mon.	19	11 44 3.13	8.966	1 43 39.6	-58.15	15 57.44	64.01	5 58.59	0.887		
Tues.	20	11 47 38.35	8.968	1 20 22.9	58.24	15 57.70	64.02	6 19.87	0.885		
Wed.	21	11 51 13.63	8.971	0 57 4.3	58.31	15 57.96	64.03	6 41.08	0.882		
Thur.	22	11 54 48.99	8.975	0 33 44.0	-58.38	15 58.23	64.04	7 2.21	0.879		
Frid.	23	11 58 24.45	8.980	N. 0 10 22.3	58.43	15 58.50	64.05	7 23.24	0.874		
Sat.	24	12 2 0.03	8.985	S. 0 13 0.6	58.47	15 58.76	64.07	7 44.15	0.868		
SUN.	25	12 5 35.77	8.992	0 36 24.2	-58.49	15 59.02	64.09	8 4.91	0.861		
Mon.	26	12 9 11.69	9.000	0 59 48.0	58.50	15 59.28	64.12	8 25.50	0.853		
Tues.	27	12 12 47.80	9.008	1 23 12.0	58.49	15 59.55	64.15	8 45.89	0.845		
Wed.	28	12 16 24.12	9.017	1 46 35.7	-58.47	15 59.82	64.18	9 6.07	0.836		
Thur.	29	12 20 0.67	9.028	2 9 58.7	58.44	16 0.09	64.21	9 26.03	0.826		
Frid.	30	12 23 37.47	9.039	2 33 20.7	58.38	16 0.36	64.25	9 45.74	0.815		
Sat.	31	12 27 14.53	9.050	S. 2 56 41.3	-58.31	16 0.64	64.29	10 5.16	0.804		

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18 from the sidereal time.  
 The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing and south declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Thur.	1	10 39 13.79	9.083	N. 8 31 0.6	-54.25	0 9.05	0.773	10 39 4.74
Frid.	2	10 42 51.63	9.071	8 9 14.3	54.59	0 9.66	0.786	10 43 1.29
Sat.	3	10 46 29.18	9.059	7 47 20.2	54.91	0 28.65	0.797	10 46 57.85
SUN.	4	10 50 6.46	9.048	7 25 18.4	-55.22	0 47.92	0.808	10 50 54.40
Mon.	5	10 53 43.48	9.037	7 3 9.4	55.51	1 7.45	0.818	10 54 50.96
Tues.	6	10 57 20.27	9.027	6 40 53.5	55.80	1 27.23	0.828	10 58 47.51
Wed.	7	11 0 56.83	9.017	6 18 30.9	-56.07	1 47.23	0.838	11 2 44.06
Thur.	8	11 4 33.17	9.009	5 56 2.2	56.32	2 7.45	0.847	11 6 40.62
Frid.	9	11 8 9.31	9.002	5 33 27.7	56.56	2 27.87	0.855	11 10 37.17
Sat.	10	11 11 45.27	8.995	5 10 47.6	-56.78	2 48.46	0.862	11 14 33.72
SUN.	11	11 15 21.07	8.989	4 48 2.3	56.99	3 9.21	0.868	11 18 30.28
Mon.	12	11 18 56.72	8.984	4 25 12.3	57.18	3 30.10	0.873	11 22 26.83
Tues.	13	11 22 32.25	8.979	4 2 17.7	-57.36	3 51.12	0.878	11 26 23.38
Wed.	14	11 26 7.68	8.975	3 39 18.9	57.53	4 12.25	0.882	11 30 19.94
Thur.	15	11 29 43.03	8.972	3 16 16.3	57.68	4 33.46	0.885	11 34 16.49
Frid.	16	11 33 18.31	8.969	2 53 10.2	-57.82	4 54.73	0.887	11 38 13.04
Sat.	17	11 36 53.55	8.968	2 30 0.9	57.95	5 16.04	0.888	11 42 9.60
SUN.	18	11 40 28.78	8.968	2 6 48.6	58.06	5 37.37	0.888	11 46 6.15
Mon.	19	11 44 4.02	8.969	1 43 33.8	-58.16	5 58.69	0.887	11 50 2.70
Tues.	20	11 47 39.29	8.971	1 20 16.8	58.25	6 19.97	0.885	11 53 59.26
Wed.	21	11 51 14.62	8.974	0 56 57.9	58.33	6 41.19	0.882	11 57 55.81
Thur.	22	11 54 50.03	8.978	0 33 37.2	-58.39	7 2.33	0.879	12 1 52.36
Frid.	23	11 58 25.55	8.983	N. 0 10 15.1	58.44	7 23.37	0.874	12 5 48.92
Sat.	24	12 2 1.19	8.988	S. 0 13 8.1	58.48	7 44.28	0.868	12 9 45.47
SUN.	25	12 5 36.98	8.995	0 36 32.0	-58.50	8 5.04	0.861	12 13 42.02
Mon.	26	12 9 12.95	9.002	0 59 56.2	58.51	8 25.63	0.853	12 17 38.58
Tues.	27	12 12 49.11	9.011	1 23 20.5	58.50	8 46.03	0.845	12 21 35.13
Wed.	28	12 16 25.48	9.020	1 46 44.5	-58.49	9 6.21	0.836	12 25 31.69
Thur.	29	12 20 2.08	9.031	2 10 7.9	58.45	9 26.16	0.826	12 29 28.24
Frid.	30	12 23 38.93	9.042	2 33 30.2	58.40	9 45.86	0.815	12 33 24.79
Sat.	31	12 27 16.05	9.053	S. 2 56 51.1	-58.33	10 5.30	0.804	12 37 21.34

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing and south declinations are increasing.

Diff. for 1 Hour,  
+ 9<sup>h</sup> 85<sup>m</sup> 6<sup>s</sup>.  
(Table III.)

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.	
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.				
		$\lambda$	$\lambda'$						
1	244	158 9 35.0	9 14.3	145.26	+ 0.79	0.003 8898	- 42.5	h m s 13 18 44.05	
2	245	159 7 42.1	7 21.3	145.33	0.80	0.003 7867	43.3	13 14 48.14	
3	246	160 5 50.9	5 30.0	145.40	0.78	0.003 6819	44.0	13 10 52.23	
4	247	161 4 1.5	3 40.5	145.48	+ 0.75	0.003 5753	- 44.7	13 6 56.32	
5	248	162 2 13.7	1 52.6	145.55	0.69	0.003 4671	45.4	13 3 0.42	
6	249	163 0 27.6	0 6.3	145.61	0.60	0.003 3573	46.1	12 59 4.51	
7	250	163 58 43.1	58 21.7	145.68	+ 0.50	0.003 2460	- 46.7	12 55 8.60	
8	251	164 57 0.2	56 38.7	145.74	0.38	0.003 1334	47.2	12 51 12.69	
9	252	165 55 18.9	54 57.3	145.81	0.26	0.003 0195	47.8	12 47 16.79	
10	253	166 53 39.1	53 17.4	145.88	+ 0.14	0.002 9044	- 48.3	12 43 20.88	
11	254	167 52 0.9	51 39.1	145.94	+ 0.02	0.002 7883	48.6	12 39 24.97	
12	255	168 50 24.3	50 2.4	146.01	- 0.08	0.002 6712	48.9	12 35 29.07	
13	256	169 48 49.2	48 27.2	146.07	- 0.16	0.002 5534	- 49.2	12 31 33.16	
14	257	170 47 15.8	46 53.7	146.14	0.24	0.002 4349	49.4	12 27 37.25	
15	258	171 45 44.0	45 21.8	146.21	0.28	0.002 3160	49.6	12 23 41.34	
16	259	172 44 13.9	43 51.6	146.28	- 0.29	0.002 1968	- 49.7	12 19 45.43	
17	260	173 42 45.6	42 23.1	146.36	0.28	0.002 0773	49.8	12 15 49.53	
18	261	174 41 19.0	40 56.4	146.43	0.24	0.001 9576	49.8	12 11 53.62	
19	262	175 39 54.3	39 31.6	146.51	- 0.16	0.001 8380	- 49.8	12 7 57.71	
20	263	176 38 31.5	38 8.8	146.59	- 0.05	0.001 7185	49.8	12 4 1.80	
21	264	177 37 10.8	36 48.0	146.68	+ 0.07	0.001 5991	49.8	12 0 5.89	
22	265	178 35 52.2	35 29.3	146.77	+ 0.20	0.001 4797	- 49.7	11 56 9.99	
23	266	179 34 35.8	34 12.8	146.86	0.34	0.001 3603	49.8	11 52 14.08	
24	267	180 33 21.7	32 58.6	146.96	0.48	0.001 2408	49.9	11 48 18.17	
25	268	181 32 9.9	31 46.6	147.06	+ 0.60	0.001 1210	- 50.0	11 44 22.27	
26	269	182 31 0.4	30 37.0	147.15	0.70	0.001 0009	50.1	11 40 26.36	
27	270	183 29 53.2	29 29.7	147.25	0.78	0.000 8803	50.3	11 36 30.45	
28	271	184 28 48.3	28 24.7	147.34	+ 0.84	0.000 7592	- 50.6	11 32 34.54	
29	272	185 27 45.6	27 21.9	147.44	0.85	0.000 6374	50.8	11 28 38.63	
30	273	186 26 45.2	26 21.4	147.53	0.85	0.000 5150	51.1	11 24 42.73	
31	274	187 25 46.9	25 23.0	147.62	+ 0.81	0.000 3919	- 51.5	11 20 46.82	
NOTE.—The numbers in column $\lambda$ correspond to the true equinox of the date; in column $\lambda'$ to the mean equinox of January 0.0.									Diff. for 1 Hour, — 9 <sup>h</sup> .8296. (Table II.)

## GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S									
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.	
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.	
	h m	h m	h m	"	h m	"	h m	m	d	
1	15 38.4	15 34.4	57 18.2	- 1.22	57 3.3	- 1.26	23 7.6	2.08	27.2	
2	15 30.2	15 26.0	56 48.0	1.29	56 32.5	1.30	23 55.4	1.92	28.2	
3	15 21.7	15 17.4	56 16.8	1.31	56 1.1	1.30	6	.	29.2	
4	15 13.2	15 9.1	55 45.6	- 1.28	55 30.6	- 1.23	0 40.0	1.80	0.7	
5	15 5.2	15 1.5	55 16.2	1.16	55 2.6	1.09	1 22.3	1.73	1.7	
6	14 58.1	14 55.1	54 50.2	0.98	54 39.1	0.86	2 3.4	1.70	2.7	
7	14 52.5	14 50.3	54 29.5	- 0.73	54 21.7	- 0.58	2 44.2	1.71	3.7	
8	14 48.7	14 47.7	54 15.8	0.41	54 12.0	- 0.22	3 25.8	1.76	4.7	
9	14 47.3	14 47.5	54 10.5	- 0.03	54 11.4	+ 0.17	4 9.1	1.85	5.7	
10	14 48.4	14 50.0	54 14.7	+ 0.38	54 20.6	+ 0.60	4 54.6	1.96	6.7	
11	14 52.4	14 55.4	54 29.1	0.81	54 40.1	1.03	5 43.0	2.07	7.7	
12	14 59.0	15 3.3	54 53.6	1.23	55 9.5	1.42	6 34.0	2.18	8.7	
13	15 8.3	15 13.9	55 27.7	+ 1.60	55 48.0	+ 1.76	7 27.2	2.25	9.7	
14	15 19.9	15 26.3	56 10.0	1.90	56 33.5	2.01	8 21.5	2.27	10.7	
15	15 33.0	15 39.9	56 58.2	2.08	57 23.6	2.12	9 15.6	2.24	11.7	
16	15 46.9	15 53.7	57 49.1	+ 2.12	58 14.2	+ 2.06	10 8.6	2.18	12.7	
17	16 0.3	16 6.5	58 38.5	1.96	59 1.3	1.82	11 0.3	2.12	13.7	
18	16 12.2	16 17.2	59 22.2	1.63	59 40.5	1.40	11 50.7	2.09	14.7	
19	16 21.4	16 24.7	59 55.8	+ 1.15	60 7.9	+ 0.86	12 40.7	2.09	15.7	
20	16 27.0	16 28.4	60 16.5	+ 0.56	60 21.4	+ 0.26	13 31.2	2.13	16.7	
21	16 28.7	16 28.1	60 22.7	- 0.04	60 20.5	- 0.32	14 23.3	2.22	17.7	
22	16 26.6	16 24.3	60 15.0	- 0.58	60 6.6	- 0.81	15 18.0	2.34	18.7	
23	16 21.4	16 17.8	59 55.7	1.00	59 42.6	1.17	16 15.5	2.45	19.7	
24	16 13.7	16 9.3	59 27.7	1.29	59 11.5	1.39	17 15.4	2.53	20.7	
25	16 4.6	15 59.8	58 54.4	- 1.45	58 36.7	- 1.49	18 16.0	2.52	21.7	
26	15 54.9	15 50.0	58 18.7	1.50	58 0.7	1.50	19 15.3	2.42	22.7	
27	15 45.1	15 40.3	57 42.8	1.48	57 25.2	1.45	20 11.5	2.26	23.7	
28	15 35.7	15 31.1	57 8.1	- 1.41	56 51.4	- 1.37	21 3.7	2.09	24.7	
29	15 26.7	15 22.5	56 35.2	1.33	56 19.6	1.28	21 51.9	1.94	25.7	
30	15 18.4	15 14.4	56 4.6	1.24	55 50.1	1.18	22 36.8	1.81	26.7	
31	15 10.6	15 7.1	55 36.2	1.13	55 23.0	1.08	23 19.3	1.73	27.7	
32	15 3.6	15 0.4	55 10.4	- 1.01	54 58.6	- 0.95	6	.	28.7	

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 1.					SATURDAY 3.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 58 37.90	2.3152	N.22 16 41.3	8.787	0	10 42 32.32	2.0244	N.13 25 33.7	12.807
1	9 0 56.62	2.3088	22 7 50.6	8.903	1	10 44 33.63	2.0193	13 12 43.8	12.858
2	9 3 14.95	2.3023	21 58 52.9	9.019	2	10 46 34.63	2.0142	12 59 50.9	12.907
3	9 5 32.90	2.2960	21 49 48.3	9.133	3	10 48 35.33	2.0092	12 46 55.0	12.954
4	9 7 50.47	2.2896	21 40 36.9	9.246	4	10 50 35.73	2.0043	12 33 56.3	13.002
5	9 10 7.65	2.2832	21 31 18.8	9.358	5	10 52 35.84	1.9993	12 20 54.8	13.048
6	9 12 24.45	2.2768	21 21 54.0	9.468	6	10 54 35.65	1.9944	12 7 50.6	13.098
7	9 14 40.86	2.2703	21 12 22.7	9.576	7	10 56 35.17	1.9897	11 54 43.8	13.134
8	9 16 56.89	2.2639	21 2 44.9	9.683	8	10 58 34.41	1.9849	11 41 34.4	13.177
9	9 19 12.53	2.2574	20 53 0.7	9.788	9	11 0 33.36	1.9802	11 28 22.6	13.218
10	9 21 27.78	2.2510	20 43 10.3	9.893	10	11 2 32.03	1.9756	11 15 8.4	13.257
11	9 23 42.65	2.2446	20 33 13.6	9.996	11	11 4 30.43	1.9711	11 1 51.8	13.295
12	9 25 57.13	2.2382	20 23 10.8	10.097	12	11 6 28.56	1.9666	10 48 33.0	13.332
13	9 28 11.23	2.2318	20 13 2.0	10.196	13	11 8 26.42	1.9622	10 35 12.0	13.368
14	9 30 24.94	2.2253	20 2 47.3	10.294	14	11 10 24.02	1.9578	10 21 48.8	13.402
15	9 32 38.26	2.2188	19 52 26.7	10.392	15	11 12 21.36	1.9535	10 8 23.6	13.437
16	9 34 51.20	2.2125	19 42 0.3	10.488	16	11 14 18.44	1.9492	9 54 56.4	13.469
17	9 37 3.76	2.2062	19 31 28.2	10.582	17	11 16 15.26	1.9450	9 41 27.3	13.501
18	9 39 15.94	2.1998	19 20 50.5	10.674	18	11 18 11.84	1.9409	9 27 56.3	13.532
19	9 41 27.74	2.1935	19 10 7.3	10.765	19	11 20 8.17	1.9368	9 14 23.5	13.561
20	9 43 39.16	2.1872	18 59 18.7	10.855	20	11 22 4.26	1.9328	9 0 49.0	13.588
21	9 45 50.20	2.1808	18 48 24.7	10.943	21	11 24 0.11	1.9289	8 47 12.9	13.615
22	9 48 0.86	2.1746	18 37 25.5	11.030	22	11 25 55.73	1.9251	8 33 35.2	13.641
23	9 50 11.15	2.1683	N.18 26 21.1	11.116	23	11 27 51.12	1.9213	N. 8 19 56.0	13.666
FRIDAY 2.					SUNDAY 4.				
0	9 52 21.06	2.1621	N.18 15 11.6	11.200	0	11 29 46.29	1.9176	N. 8 6 15.3	13.690
1	9 54 30.60	2.1559	18 3 57.1	11.282	1	11 31 41.23	1.9139	7 52 33.2	13.713
2	9 56 39.77	2.1498	17 52 37.7	11.363	2	11 33 35.96	1.9104	7 38 49.8	13.734
3	9 58 48.57	2.1437	17 41 13.5	11.443	3	11 35 30.48	1.9068	7 25 5.1	13.755
4	10 0 57.01	2.1376	17 29 44.5	11.522	4	11 37 24.78	1.9033	7 11 19.2	13.774
5	10 3 5.08	2.1314	17 18 10.8	11.599	5	11 39 18.88	1.8999	6 57 32.2	13.793
6	10 5 12.78	2.1254	17 6 32.6	11.674	6	11 41 12.77	1.8966	6 43 44.1	13.811
7	10 7 20.13	2.1195	16 54 49.9	11.748	7	11 43 6.47	1.8933	6 29 54.9	13.828
8	10 9 27.12	2.1135	16 43 2.8	11.822	8	11 44 59.97	1.8901	6 16 4.8	13.843
9	10 11 33.75	2.1076	16 31 11.3	11.894	9	11 46 53.28	1.8870	6 2 13.8	13.857
10	10 13 40.03	2.1018	16 19 15.5	11.964	10	11 48 46.41	1.8840	5 48 22.0	13.870
11	10 15 45.96	2.0959	16 7 15.6	12.033	11	11 50 39.36	1.8810	5 34 29.4	13.883
12	10 17 51.54	2.0901	15 55 11.6	12.100	12	11 52 32.13	1.8780	5 20 36.1	13.894
13	10 19 56.77	2.0843	15 43 3.6	12.166	13	11 54 24.72	1.8752	5 6 42.1	13.904
14	10 22 1.66	2.0787	15 30 51.7	12.231	14	11 56 17.15	1.8724	4 52 47.6	13.913
15	10 24 6.21	2.0730	15 18 35.9	12.295	15	11 58 9.41	1.8697	4 38 52.5	13.923
16	10 26 10.42	2.0674	15 6 16.3	12.357	16	12 0 1.51	1.8671	4 24 56.9	13.931
17	10 28 14.30	2.0618	14 53 53.1	12.417	17	12 1 53.46	1.8645	4 11 0.8	13.938
18	10 30 17.84	2.0563	14 41 26.3	12.477	18	12 3 45.25	1.8619	3 57 4.4	13.943
19	10 32 21.06	2.0509	14 28 55.9	12.535	19	12 5 36.89	1.8594	3 43 7.7	13.947
20	10 34 23.95	2.0455	14 16 22.1	12.592	20	12 7 28.38	1.8570	3 29 10.8	13.951
21	10 36 26.52	2.0402	14 3 44.8	12.648	21	12 9 19.73	1.8548	3 15 13.6	13.954
22	10 38 28.77	2.0348	13 51 4.3	12.702	22	12 11 10.95	1.8525	3 1 16.3	13.956
23	10 40 30.70	2.0296	13 38 20.6	12.755	23	12 13 2.03	1.8503	2 47 18.9	13.958
24	10 42 32.32	2.0244	N.13 25 33.7	12.807	24	12 14 52.99	1.8483	N. 2 33 21.4	13.958



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 5.					WEDNESDAY 7.				
0	12 14 52.99	1.8463	N. 2 33 21.4	13.958	0	13 42 25.69	1.8247	S. 8 20 58.1	13.006
1	12 16 43.82	1.8462	2 19 24.0	13.957	1	13 44 15.20	1.8258	8 33 57.3	12.968
2	12 18 34.53	1.8442	2 5 26.6	13.955	2	13 46 4.78	1.8269	8 46 54.2	12.929
3	12 20 25.12	1.8423	1 51 29.4	13.953	3	13 47 54.43	1.8281	8 59 48.8	12.890
4	12 22 15.60	1.8404	1 37 32.3	13.949	4	13 49 44.15	1.8293	9 12 41.0	12.849
5	12 24 5.97	1.8387	1 23 35.5	13.945	5	13 51 33.95	1.8307	9 25 30.7	12.808
6	12 25 56.24	1.8369	1 9 38.9	13.940	6	13 53 23.83	1.8320	9 38 17.9	12.766
7	12 27 46.40	1.8353	0 55 42.7	13.934	7	13 55 13.79	1.8334	9 51 2.6	12.723
8	12 29 36.47	1.8337	0 41 46.8	13.928	8	13 57 3.84	1.8350	10 3 44.7	12.680
9	12 31 26.44	1.8322	0 27 51.4	13.919	9	13 58 53.99	1.8366	10 16 24.2	12.637
10	12 33 16.33	1.8308	0 13 56.5	13.911	10	14 0 44.23	1.8382	10 29 1.1	12.592
11	12 35 6.14	1.8294	N. 0 0 2.1	13.902	11	14 2 34.57	1.8398	10 41 35.2	12.546
12	12 36 55.86	1.8281	S. 0 13 51.7	13.892	12	14 4 25.01	1.8416	10 54 6.6	12.500
13	12 38 45.51	1.8268	0 27 44.9	13.881	13	14 6 15.56	1.8434	11 6 35.2	12.453
14	12 40 35.08	1.8257	0 41 37.4	13.868	14	14 8 6.22	1.8453	11 19 1.0	12.406
15	12 42 24.59	1.8246	0 55 29.1	13.856	15	14 9 56.99	1.8471	11 31 23.9	12.358
16	12 44 14.03	1.8235	1 9 20.1	13.843	16	14 11 47.87	1.8490	11 43 43.9	12.308
17	12 46 3.41	1.8225	1 23 10.2	13.828	17	14 13 38.87	1.8511	11 56 0.9	12.258
18	12 47 52.73	1.8216	1 36 59.5	13.813	18	14 15 30.00	1.8532	12 8 14.9	12.208
19	12 49 42.00	1.8208	1 50 47.8	13.798	19	14 17 21.25	1.8553	12 20 25.9	12.158
20	12 51 31.22	1.8200	2 4 35.2	13.781	20	14 19 12.64	1.8576	12 32 33.8	12.106
21	12 53 20.40	1.8193	2 18 21.5	13.763	21	14 21 4.16	1.8598	12 44 38.6	12.053
22	12 55 9.54	1.8187	2 32 6.8	13.745	22	14 22 55.81	1.8620	12 56 40.2	12.000
23	12 56 58.64	1.8181	S. 2 45 50.9	13.726	23	14 24 47.60	1.8644	S. 13 8 38.6	11.947
TUESDAY 6.					THURSDAY 8.				
0	12 58 47.71	1.8176	S. 2 59 33.9	13.707	0	14 26 39.54	1.8668	S. 13 20 33.8	11.893
1	13 0 36.75	1.8172	3 13 15.7	13.686	1	14 28 31.62	1.8693	13 32 25.7	11.837
2	13 2 25.77	1.8168	3 26 56.2	13.664	2	14 30 23.85	1.8718	13 44 14.2	11.781
3	13 4 14.76	1.8164	3 40 35.4	13.642	3	14 32 16.24	1.8744	13 55 59.4	11.724
4	13 6 3.74	1.8162	3 54 13.3	13.619	4	14 34 8.78	1.8770	14 7 41.1	11.666
5	13 7 52.71	1.8160	4 7 49.7	13.595	5	14 36 1.48	1.8797	14 19 19.3	11.608
6	13 9 41.66	1.8158	4 21 24.7	13.572	6	14 37 54.34	1.8824	14 30 54.0	11.549
7	13 11 30.61	1.8158	4 34 58.3	13.547	7	14 39 47.37	1.8853	14 42 25.2	11.490
8	13 13 19.56	1.8158	4 48 30.3	13.520	8	14 41 40.57	1.8881	14 53 52.8	11.429
9	13 15 8.51	1.8159	5 2 0.7	13.493	9	14 43 33.94	1.8909	15 5 16.7	11.368
10	13 16 57.47	1.8161	5 15 29.5	13.467	10	14 45 27.48	1.8938	15 16 37.0	11.307
11	13 18 46.44	1.8163	5 28 56.7	13.438	11	14 47 21.19	1.8968	15 27 53.5	11.244
12	13 20 35.42	1.8165	5 42 22.1	13.409	12	14 49 15.09	1.8998	15 39 6.3	11.182
13	13 22 24.42	1.8168	5 55 45.8	13.380	13	14 51 9.17	1.9029	15 50 15.3	11.118
14	13 24 13.44	1.8173	6 9 7.7	13.349	14	14 53 3.44	1.9060	16 1 20.4	11.053
15	13 26 2.49	1.8178	6 22 27.7	13.318	15	14 54 57.89	1.9092	16 12 21.6	10.987
16	13 27 51.57	1.8183	6 35 45.9	13.287	16	14 56 52.54	1.9124	16 23 18.8	10.921
17	13 29 40.68	1.8188	6 49 2.1	13.254	17	14 58 47.38	1.9157	16 34 12.1	10.854
18	13 31 29.82	1.8194	7 2 16.4	13.221	18	15 0 42.42	1.9190	16 45 1.3	10.787
19	13 33 19.01	1.8202	7 15 28.6	13.187	19	15 2 37.66	1.9223	16 55 46.5	10.718
20	13 35 8.24	1.8209	7 28 38.8	13.153	20	15 4 33.10	1.9258	17 6 27.5	10.649
21	13 36 57.52	1.8218	7 41 46.9	13.117	21	15 6 28.75	1.9292	17 17 4.4	10.579
22	13 38 46.85	1.8227	7 54 52.8	13.081	22	15 8 24.60	1.9327	17 27 37.0	10.508
23	13 40 36.24	1.8237	8 7 56.6	13.044	23	15 10 20.67	1.9363	17 38 5.4	10.437
24	13 42 25.69	1.8247	S. 8 20 58.1	13.006	24	15 12 16.95	1.9398	S. 17 48 29.5	10.365

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 9.					SUNDAY 11.				
0	15 12 16.95	1.9393	S. 17 48 29.5	10.365	0	16 50 5.20	2.1425	S. 24 28 20.2	5.990
1	15 14 13.44	1.9433	17 58 49.2	10.293	1	16 52 13.88	2.1469	24 34 16.3	5.879
2	15 16 10.15	1.9470	18 9 4.6	10.219	2	16 54 22.83	2.1513	24 40 5.7	5.768
3	15 18 7.08	1.9508	18 19 15.5	10.145	3	16 56 32.04	2.1558	24 45 48.4	5.655
4	15 20 4.24	1.9545	18 29 22.0	10.070	4	16 58 41.52	2.1601	24 51 24.3	5.542
5	15 22 1.62	1.9582	18 39 23.9	9.993	5	17 0 51.25	2.1644	24 56 53.4	5.428
6	15 23 59.22	1.9619	18 49 21.2	9.917	6	17 3 1.25	2.1688	25 2 15.6	5.313
7	15 25 57.05	1.9658	18 59 13.9	9.840	7	17 5 11.51	2.1732	25 7 31.0	5.198
8	15 27 55.12	1.9698	19 9 2.0	9.762	8	17 7 22.03	2.1775	25 12 39.4	5.082
9	15 29 53.42	1.9736	19 18 45.4	9.683	9	17 9 32.81	2.1818	25 17 40.8	4.965
10	15 31 51.95	1.9775	19 28 24.0	9.603	10	17 11 43.84	2.1860	25 22 35.2	4.847
11	15 33 50.72	1.9815	19 37 57.8	9.523	11	17 13 55.13	2.1903	25 27 22.5	4.728
12	15 35 49.73	1.9855	19 47 26.8	9.442	12	17 16 6.67	2.1945	25 32 2.6	4.609
13	15 37 48.98	1.9895	19 56 50.9	9.360	13	17 18 18.47	2.1987	25 36 35.6	4.489
14	15 39 48.47	1.9936	20 6 10.0	9.277	14	17 20 30.51	2.2028	25 41 1.3	4.368
15	15 41 48.21	1.9977	20 15 24.1	9.193	15	17 22 42.80	2.2069	25 45 19.8	4.247
16	15 43 48.20	2.0018	20 24 33.2	9.109	16	17 24 55.34	2.2110	25 49 30.9	4.124
17	15 45 48.43	2.0059	20 33 37.2	9.024	17	17 27 8.12	2.2150	25 53 34.7	4.002
18	15 47 48.91	2.0102	20 42 36.1	8.938	18	17 29 21.14	2.2190	25 57 31.1	3.878
19	15 49 49.65	2.0144	20 51 29.8	8.852	19	17 31 34.40	2.2230	26 1 20.0	3.753
20	15 51 50.64	2.0186	21 0 18.3	8.764	20	17 33 47.90	2.2270	26 5 1.4	3.628
21	15 53 51.88	2.0228	21 9 1.5	8.676	21	17 36 1.64	2.2308	26 8 35.3	3.502
22	15 55 53.38	2.0272	21 17 39.4	8.587	22	17 38 15.61	2.2347	26 12 1.6	3.375
23	15 57 55.14	2.0315	S. 21 26 11.9	8.497	23	17 40 29.80	2.2385	S. 26 15 20.3	3.248
SATURDAY 10.					MONDAY 12.				
0	15 59 57.16	2.0358	S. 21 34 39.0	8.406	0	17 42 44.22	2.2423	S. 26 18 31.3	3.119
1	16 1 59.44	2.0401	21 43 0.6	8.314	1	17 44 58.87	2.2460	26 21 34.6	2.991
2	16 4 1.97	2.0444	21 51 16.7	8.222	2	17 47 13.74	2.2497	26 24 30.2	2.862
3	16 6 4.77	2.0488	21 59 27.3	8.130	3	17 49 28.83	2.2533	26 27 18.0	2.732
4	16 8 7.83	2.0532	22 7 32.3	8.036	4	17 51 44.13	2.2568	26 29 58.0	2.602
5	16 10 11.16	2.0577	22 15 31.6	7.941	5	17 53 59.64	2.2603	26 32 30.1	2.470
6	16 12 14.75	2.0621	22 23 25.2	7.846	6	17 56 15.36	2.2638	26 34 54.3	2.338
7	16 14 18.61	2.0665	22 31 13.1	7.750	7	17 58 31.29	2.2672	26 37 10.6	2.205
8	16 16 22.73	2.0709	22 38 55.2	7.653	8	18 0 47.42	2.2705	26 39 18.9	2.072
9	16 18 27.12	2.0754	22 46 31.4	7.554	9	18 3 3.75	2.2738	26 41 19.2	1.938
10	16 20 31.78	2.0799	22 54 1.7	7.456	10	18 5 20.27	2.2770	26 43 11.4	1.803
11	16 22 36.71	2.0843	23 1 26.1	7.357	11	18 7 36.99	2.2802	26 44 55.6	1.668
12	16 24 41.90	2.0888	23 8 44.5	7.257	12	18 9 53.89	2.2833	26 46 31.6	1.533
13	16 26 47.36	2.0933	23 15 56.9	7.156	13	18 12 10.98	2.2863	26 47 59.4	1.396
14	16 28 53.09	2.0978	23 23 3.2	7.053	14	18 14 28.25	2.2893	26 49 19.1	1.259
15	16 30 59.09	2.1023	23 30 3.3	6.950	15	18 16 45.70	2.2923	26 50 30.6	1.122
16	16 33 5.36	2.1068	23 36 57.2	6.847	16	18 19 3.32	2.2951	26 51 33.8	0.984
17	16 35 11.90	2.1113	23 43 44.9	6.743	17	18 21 21.11	2.2978	26 52 28.7	0.846
18	16 37 18.71	2.1158	23 50 26.3	6.638	18	18 23 39.06	2.3006	26 53 15.3	0.707
19	16 39 25.79	2.1203	23 57 1.4	6.532	19	18 25 57.18	2.3033	26 53 53.5	0.567
20	16 41 33.14	2.1247	24 3 30.1	6.425	20	18 28 15.45	2.3058	26 54 23.3	0.427
21	16 43 40.75	2.1291	24 9 52.4	6.318	21	18 30 33.87	2.3083	26 54 44.7	0.287
22	16 45 48.63	2.1336	24 16 8.2	6.209	22	18 32 52.44	2.3108	26 54 57.7	0.147
23	16 47 56.78	2.1381	24 22 17.5	6.100	23	18 35 11.16	2.3132	26 55 2.3	-0.005
24	16 50 5.20	2.1425	S. 24 28 20.2	5.990	24	18 37 30.02	2.3154	S. 26 54 58.3	+0.138

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 13.					THURSDAY 15.				
0	18 37 30.02	2.3154	S. 26 54 58.3	+0.138	0	20 29 49.19	2.3356	S. 24 0 50.8	7.123
1	18 39 49.01	2.3177	26 54 45.8	0.279	1	20 32 9.29	2.3343	23 53 39.2	7.265
2	18 42 8.14	2.3198	26 54 24.8	0.422	2	20 34 29.31	2.3329	23 46 19.0	7.407
3	18 44 27.39	2.3218	26 53 55.2	0.564	3	20 36 49.24	2.3314	23 38 50.4	7.548
4	18 46 46.76	2.3238	26 53 17.1	0.708	4	20 39 9.08	2.3300	23 31 13.3	7.688
5	18 49 6.25	2.3258	26 52 30.3	0.852	5	20 41 28.84	2.3285	23 23 27.8	7.828
6	18 51 25.85	2.3276	26 51 34.9	0.995	6	20 43 48.50	2.3269	23 15 33.9	7.968
7	18 53 45.56	2.3294	26 50 30.9	1.139	7	20 46 8.07	2.3253	23 7 31.7	8.106
8	18 56 5.38	2.3311	26 49 18.2	1.284	8	20 48 27.54	2.3237	22 59 21.2	8.244
9	18 58 25.29	2.3327	26 47 56.8	1.429	9	20 50 46.91	2.3219	22 51 2.4	8.383
10	19 0 45.30	2.3343	26 46 26.7	1.574	10	20 53 6.17	2.3202	22 42 35.3	8.520
11	19 3 5.40	2.3357	26 44 47.9	1.719	11	20 55 25.33	2.3184	22 34 0.0	8.657
12	19 5 25.58	2.3370	26 43 0.4	1.865	12	20 57 44.38	2.3166	22 25 16.5	8.793
13	19 7 45.84	2.3383	26 41 4.1	2.011	13	21 0 3.32	2.3147	22 16 24.9	8.928
14	19 10 6.18	2.3396	26 38 59.1	2.158	14	21 2 22.14	2.3128	22 7 25.2	9.063
15	19 12 26.59	2.3407	26 36 45.2	2.304	15	21 4 40.85	2.3108	21 58 17.4	9.197
16	19 14 47.06	2.3418	26 34 22.6	2.450	16	21 6 59.44	2.3088	21 49 1.6	9.330
17	19 17 7.60	2.3428	26 31 51.2	2.597	17	21 9 17.91	2.3068	21 39 37.8	9.463
18	19 19 28.19	2.3436	26 29 11.0	2.743	18	21 11 36.26	2.3048	21 30 6.1	9.594
19	19 21 48.83	2.3444	26 26 22.0	2.890	19	21 13 54.49	2.3028	21 20 26.5	9.725
20	19 24 9.52	2.3452	26 23 24.2	3.038	20	21 16 12.59	2.3006	21 10 39.1	9.855
21	19 26 30.25	2.3458	26 20 17.5	3.185	21	21 18 30.56	2.2984	21 0 43.9	9.984
22	19 28 51.02	2.3464	26 17 2.0	3.332	22	21 20 48.40	2.2963	20 50 41.0	10.113
23	19 31 11.82	2.3469	S. 26 13 37.7	3.479	23	21 23 6.12	2.2942	S. 20 40 30.4	10.241
WEDNESDAY 14.					FRIDAY 16.				
0	19 33 32.65	2.3473	S. 26 10 4.5	3.627	0	21 25 23.70	2.2919	S. 20 30 12.1	10.368
1	19 35 53.50	2.3477	26 6 22.5	3.773	1	21 27 41.15	2.2897	20 19 46.2	10.494
2	19 38 14.37	2.3479	26 2 31.7	3.921	2	21 29 58.46	2.2874	20 9 12.8	10.619
3	19 40 35.25	2.3482	25 58 32.0	4.068	3	21 32 15.64	2.2853	19 58 31.9	10.743
4	19 42 56.15	2.3483	25 54 23.5	4.215	4	21 34 32.69	2.2830	19 47 43.6	10.867
5	19 45 17.05	2.3483	25 50 6.2	4.362	5	21 36 49.60	2.2807	19 36 47.9	10.989
6	19 47 37.95	2.3483	25 45 40.1	4.509	6	21 39 6.37	2.2784	19 25 44.9	11.111
7	19 49 58.84	2.3482	25 41 5.1	4.657	7	21 41 23.01	2.2761	19 14 34.6	11.232
8	19 52 19.73	2.3480	25 36 21.3	4.803	8	21 43 39.50	2.2738	19 3 17.1	11.351
9	19 54 40.60	2.3477	25 31 28.7	4.950	9	21 45 55.86	2.2715	18 51 52.5	11.469
10	19 57 1.45	2.3473	25 26 27.3	5.097	10	21 48 12.08	2.2691	18 40 20.8	11.587
11	19 59 22.28	2.3469	25 21 17.1	5.243	11	21 50 28.15	2.2668	18 28 42.1	11.703
12	20 1 43.08	2.3464	25 15 58.1	5.390	12	21 52 44.09	2.2644	18 16 56.4	11.819
13	20 4 3.85	2.3459	25 10 30.3	5.536	13	21 54 59.88	2.2621	18 5 3.8	11.934
14	20 6 24.59	2.3453	25 4 53.8	5.681	14	21 57 15.54	2.2598	17 53 4.3	12.047
15	20 8 45.29	2.3447	24 59 8.6	5.827	15	21 59 31.06	2.2575	17 40 58.1	12.159
16	20 11 5.95	2.3439	24 53 14.6	5.973	16	22 1 46.44	2.2552	17 28 45.2	12.270
17	20 13 26.56	2.3431	24 47 11.9	6.118	17	22 4 1.68	2.2528	17 16 25.6	12.381
18	20 15 47.12	2.3422	24 41 0.5	6.262	18	22 6 16.78	2.2506	17 3 59.5	12.490
19	20 18 7.62	2.3413	24 34 40.5	6.406	19	22 8 31.75	2.2483	16 51 26.9	12.598
20	20 20 28.07	2.3403	24 28 11.8	6.551	20	22 10 46.58	2.2460	16 38 47.8	12.705
21	20 22 48.45	2.3392	24 21 34.4	6.694	21	22 13 1.27	2.2437	16 26 2.3	12.811
22	20 25 8.77	2.3381	24 14 48.5	6.838	22	22 15 15.82	2.2414	16 13 10.5	12.915
23	20 27 29.02	2.3368	24 7 53.9	6.981	23	22 17 30.24	2.2393	16 0 12.5	13.018
24	20 29 49.19	2.3356	S. 24 0 50.8	7.123	24	22 19 44.53	2.2370	S. 15 47 8.3	13.121

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 17.					MONDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	22 19 44.53	2.2370	S. 15 47 8.3	13.121	0	0 5 11.49	2.1747	S. 3 45 23.9	16.385
1	22 21 58.68	2.2348	15 33 58.0	13.221	1	0 7 21.97	2.1748	3 28 59.9	16.415
2	22 24 12.70	2.2326	15 20 41.8	13.320	2	0 9 32.46	2.1749	3 12 34.1	16.444
3	22 26 26.59	2.2304	15 7 19.6	13.419	3	0 11 42.96	2.1751	2 56 6.6	16.471
4	22 28 40.35	2.2283	14 53 51.5	13.516	4	0 13 53.47	2.1753	2 39 37.6	16.495
5	22 30 53.99	2.2263	14 40 17.7	13.612	5	0 16 3.99	2.1755	2 23 7.2	16.518
6	22 33 7.50	2.2241	14 26 38.1	13.707	6	0 18 14.53	2.1758	2 6 35.4	16.541
7	22 35 20.88	2.2220	14 12 52.9	13.800	7	0 20 25.09	2.1763	1 50 2.3	16.561
8	22 37 34.14	2.2200	13 59 2.1	13.892	8	0 22 35.68	2.1768	1 33 28.1	16.578
9	22 39 47.28	2.2180	13 45 5.8	13.983	9	0 24 46.31	2.1774	1 16 52.9	16.594
10	22 42 0.30	2.2160	13 31 4.1	14.072	10	0 26 56.97	2.1780	1 0 16.8	16.609
11	22 44 13.20	2.2141	13 16 57.1	14.160	11	0 29 7.67	2.1788	0 43 39.8	16.622
12	22 46 25.99	2.2122	13 2 44.9	14.247	12	0 31 18.42	2.1795	0 27 2.1	16.633
13	22 48 38.66	2.2103	12 48 27.5	14.332	13	0 33 29.21	2.1803	S. 0 10 23.8	16.643
14	22 50 51.22	2.2085	12 34 5.1	14.416	14	0 35 40.06	2.1813	N. 0 6 15.0	16.651
15	22 53 3.68	2.2067	12 19 37.6	14.499	15	0 37 50.97	2.1823	0 22 54.3	16.657
16	22 55 16.03	2.2049	12 5 5.2	14.580	16	0 40 1.93	2.1833	0 39 33.8	16.660
17	22 57 28.27	2.2032	11 50 28.0	14.660	17	0 42 12.96	2.1844	0 56 13.5	16.663
18	22 59 40.41	2.2015	11 35 46.0	14.738	18	0 44 24.06	2.1857	1 12 53.4	16.664
19	23 1 52.45	2.1998	11 20 59.4	14.815	19	0 46 35.24	2.1869	1 29 33.2	16.663
20	23 4 4.39	2.1983	11 6 8.2	14.891	20	0 48 46.49	2.1882	1 46 12.9	16.660
21	23 6 16.24	2.1968	10 51 12.5	14.965	21	0 50 57.82	2.1896	2 2 52.4	16.655
22	23 8 28.00	2.1953	10 36 12.4	15.038	22	0 53 9.24	2.1911	2 19 31.5	16.648
23	23 10 39.67	2.1938	S. 10 21 8.0	15.108	23	0 55 20.75	2.1927	N. 2 36 10.2	16.640
SUNDAY 18.					TUESDAY 20.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 12 51.25	2.1923	S. 10 5 59.4	15.178	0	0 57 32.36	2.1943	N. 2 52 48.3	16.629
1	23 15 2.75	2.1909	9 50 46.6	15.247	1	0 59 44.06	2.1959	3 9 25.7	16.618
2	23 17 14.16	2.1896	9 35 29.8	15.313	2	1 1 55.87	2.1977	3 26 2.4	16.604
3	23 19 25.50	2.1884	9 20 9.1	15.378	3	1 4 7.79	2.1996	3 42 38.2	16.589
4	23 21 36.77	2.1872	9 4 44.5	15.442	4	1 6 19.82	2.2014	3 59 13.0	16.572
5	23 23 47.96	2.1859	8 49 16.1	15.504	5	1 8 31.96	2.2034	4 15 46.8	16.553
6	23 25 59.08	2.1848	8 33 44.0	15.564	6	1 10 44.23	2.2055	4 32 19.4	16.532
7	23 28 10.14	2.1838	8 18 8.4	15.623	7	1 12 56.62	2.2076	4 48 50.6	16.508
8	23 30 21.14	2.1828	8 2 29.2	15.682	8	1 15 9.14	2.2097	5 5 20.4	16.484
9	23 32 32.08	2.1818	7 46 46.6	15.738	9	1 17 21.79	2.2119	5 21 48.7	16.458
10	23 34 42.96	2.1809	7 31 0.7	15.792	10	1 19 34.57	2.2143	5 38 15.3	16.429
11	23 36 53.79	2.1801	7 15 11.6	15.844	11	1 21 47.50	2.2167	5 54 40.2	16.400
12	23 39 4.57	2.1793	6 59 19.4	15.896	12	1 24 0.57	2.2191	6 11 3.3	16.368
13	23 41 15.31	2.1787	6 43 24.1	15.946	13	1 26 13.79	2.2216	6 27 24.4	16.334
14	23 43 26.01	2.1780	6 27 25.9	15.993	14	1 28 27.16	2.2242	6 43 43.4	16.298
15	23 45 36.67	2.1773	6 11 24.9	16.040	15	1 30 40.69	2.2268	7 0 0.2	16.261
16	23 47 47.29	2.1768	5 55 21.1	16.085	16	1 32 54.38	2.2295	7 16 14.7	16.222
17	23 49 57.88	2.1763	5 39 14.7	16.128	17	1 35 8.23	2.2323	7 32 26.8	16.181
18	23 52 8.45	2.1759	5 23 5.7	16.170	18	1 37 22.25	2.2352	7 48 36.4	16.138
19	23 54 18.99	2.1755	5 6 54.3	16.210	19	1 39 36.45	2.2381	8 4 43.4	16.094
20	23 56 29.51	2.1753	4 50 40.5	16.248	20	1 41 50.82	2.2410	8 20 47.7	16.048
21	23 58 40.02	2.1751	4 34 24.5	16.285	21	1 44 5.37	2.2441	8 36 49.1	15.999
22	0 0 50.52	2.1749	4 18 6.3	16.320	22	1 46 20.11	2.2472	8 52 47.6	15.949
23	0 3 1.01	2.1748	4 1 46.1	16.353	23	1 48 35.03	2.2503	9 8 43.0	15.897
24	0 5 11.49	2.1747	S. 3 45 23.9	16.385	24	1 50 50.15	2.2536	N. 9 24 35.2	15.843

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 21.					FRIDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	1 50 50.15	2.2536	N. 9 24 35.2	15.843	0	3 43 34.23	2.4539	N. 20 29 14.4	11.195
1	1 53 5.46	2.2568	9 40 24.1	15.788	1	3 46 1.60	2.4583	20 40 22.0	11.058
2	1 55 20.96	2.2601	9 56 9.7	15.731	2	3 48 29.23	2.4627	20 51 21.3	10.919
3	1 57 36.67	2.2635	10 11 51.8	15.672	3	3 50 57.12	2.4670	21 2 12.3	10.779
4	1 59 52.58	2.2669	10 27 30.3	15.610	4	3 53 25.27	2.4713	21 12 54.8	10.638
5	2 2 8.70	2.2705	10 43 5.0	15.547	5	3 55 53.68	2.4757	21 23 28.9	10.497
6	2 4 25.04	2.2741	10 58 35.9	15.483	6	3 58 22.35	2.4799	21 33 54.4	10.353
7	2 6 41.59	2.2777	11 14 2.9	15.416	7	4 0 51.27	2.4842	21 44 11.2	10.208
8	2 8 58.36	2.2813	11 29 25.8	15.348	8	4 3 20.45	2.4883	21 54 19.3	10.062
9	2 11 15.35	2.2850	11 44 44.6	15.278	9	4 5 49.87	2.4924	22 4 18.6	9.914
10	2 13 32.56	2.2888	11 59 59.1	15.205	10	4 8 19.54	2.4965	22 14 9.0	9.765
11	2 15 50.00	2.2926	12 15 9.2	15.132	11	4 10 49.45	2.5005	22 23 50.4	9.615
12	2 18 7.67	2.2964	12 30 14.9	15.057	12	4 13 19.60	2.5045	22 33 22.8	9.463
13	2 20 25.57	2.3003	12 45 16.0	14.979	13	4 15 49.99	2.5084	22 42 46.0	9.311
14	2 22 43.71	2.3043	13 0 12.4	14.900	14	4 18 20.61	2.5123	22 52 0.1	9.158
15	2 25 2.09	2.3083	13 15 4.0	14.818	15	4 20 51.46	2.5160	23 1 4.9	9.002
16	2 27 20.71	2.3123	13 29 50.7	14.736	16	4 23 22.53	2.5198	23 10 0.3	8.845
17	2 29 39.57	2.3164	13 44 32.3	14.652	17	4 25 53.83	2.5235	23 18 46.3	8.688
18	2 31 58.68	2.3205	13 59 8.8	14.565	18	4 28 25.35	2.5271	23 27 22.9	8.531
19	2 34 18.03	2.3247	14 13 40.1	14.477	19	4 30 57.08	2.5306	23 35 50.0	8.372
20	2 36 37.64	2.3289	14 28 6.1	14.388	20	4 33 29.02	2.5341	23 44 7.5	8.211
21	2 38 57.50	2.3332	14 42 26.7	14.297	21	4 36 1.17	2.5375	23 52 15.3	8.049
22	2 41 17.62	2.3374	14 56 41.7	14.203	22	4 38 33.52	2.5408	24 0 13.4	7.887
23	2 43 37.99	2.3417	N. 15 10 51.1	14.108	23	4 41 6.06	2.5439	N. 24 8 1.8	7.724
THURSDAY 22.					SATURDAY 24.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	2 45 58.62	2.3460	N. 15 24 54.7	14.012	0	4 43 38.79	2.5471	N. 24 15 40.3	7.559
1	2 48 19.51	2.3503	15 38 52.5	13.913	1	4 46 11.71	2.5501	24 23 8.9	7.394
2	2 50 40.66	2.3548	15 52 44.3	13.813	2	4 48 44.80	2.5530	24 30 27.6	7.228
3	2 53 2.08	2.3592	16 6 30.0	13.711	3	4 51 18.07	2.5559	24 37 36.3	7.061
4	2 55 23.76	2.3636	16 20 9.6	13.607	4	4 53 51.51	2.5587	24 44 34.9	6.893
5	2 57 45.71	2.3681	16 33 42.9	13.502	5	4 56 25.11	2.5613	24 51 23.4	6.724
6	3 0 7.93	2.3726	16 47 9.8	13.395	6	4 58 58.87	2.5639	24 58 1.8	6.555
7	3 2 30.42	2.3770	17 0 30.3	13.287	7	5 1 32.78	2.5663	25 4 30.0	6.385
8	3 4 53.17	2.3814	17 13 44.2	13.177	8	5 4 6.83	2.5687	25 10 48.0	6.214
9	3 7 16.19	2.3860	17 26 51.5	13.065	9	5 6 41.02	2.5709	25 16 55.7	6.043
10	3 9 39.49	2.3906	17 39 52.0	12.951	10	5 9 15.34	2.5731	25 22 53.1	5.871
11	3 12 3.06	2.3951	17 52 45.6	12.836	11	5 11 49.79	2.5752	25 28 40.2	5.698
12	3 14 26.90	2.3996	18 5 32.3	12.719	12	5 14 24.36	2.5771	25 34 16.9	5.524
13	3 16 51.01	2.4042	18 18 11.9	12.600	13	5 16 59.04	2.5789	25 39 43.1	5.350
14	3 19 15.40	2.4088	18 30 44.3	12.480	14	5 19 33.83	2.5806	25 44 58.9	5.176
15	3 21 40.06	2.4133	18 43 9.5	12.358	15	5 22 8.71	2.5822	25 50 4.2	5.001
16	3 24 4.99	2.4178	18 55 27.3	12.235	16	5 24 43.68	2.5837	25 54 59.0	4.826
17	3 26 30.20	2.4224	19 7 37.7	12.111	17	5 27 18.74	2.5849	25 59 43.3	4.650
18	3 28 55.68	2.4269	19 19 40.6	11.984	18	5 29 53.88	2.5862	26 4 17.0	4.473
19	3 31 21.43	2.4314	19 31 35.8	11.856	19	5 32 29.09	2.5873	26 8 40.1	4.297
20	3 33 47.45	2.4359	19 43 23.3	11.727	20	5 35 4.36	2.5883	26 12 52.6	4.120
21	3 36 13.74	2.4404	19 55 3.0	11.596	21	5 37 39.68	2.5891	26 16 54.5	3.943
22	3 38 40.30	2.4449	20 6 34.8	11.463	22	5 40 15.05	2.5898	26 20 45.7	3.765
23	3 41 7.13	2.4494	20 17 58.6	11.330	23	5 42 50.46	2.5904	26 24 26.3	3.588
24	3 43 34.23	2.4539	N. 20 29 14.4	11.195	24	5 45 25.90	2.5908	N. 26 27 56.2	3.409

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 25.					TUESDAY 27.				
0	5 45 25.90	2.5908	N. 26 27 56.2	3.409	0	7 47 50.14	2.4628	N. 25 50 13.3	4.766
1	5 48 1.36	2.5912	26 31 15.4	3.231	1	7 50 17.75	2.4574	25 45 22.8	4.918
2	5 50 36.84	2.5914	26 34 23.9	3.053	2	7 52 45.03	2.4520	25 40 23.2	5.068
3	5 53 12.33	2.5914	26 37 21.7	2.874	3	7 55 11.99	2.4466	25 35 14.7	5.217
4	5 55 47.81	2.5913	26 40 8.8	2.696	4	7 57 38.62	2.4410	25 29 57.2	5.365
5	5 58 23.29	2.5912	26 42 45.2	2.518	5	8 0 4.91	2.4353	25 24 30.9	5.512
6	6 0 58.75	2.5908	26 45 10.9	2.339	6	8 2 30.86	2.4297	25 18 55.8	5.658
7	6 3 34.19	2.5904	26 47 25.9	2.160	7	8 4 56.47	2.4240	25 13 12.0	5.802
8	6 6 9.60	2.5898	26 49 30.2	1.982	8	8 7 21.74	2.4182	25 7 19.6	5.945
9	6 8 44.96	2.5890	26 51 23.7	1.803	9	8 9 46.66	2.4123	25 1 18.6	6.087
10	6 11 20.28	2.5882	26 53 6.5	1.625	10	8 12 11.22	2.4064	24 55 9.1	6.228
11	6 13 55.54	2.5872	26 54 38.7	1.448	11	8 14 35.43	2.4005	24 48 51.3	6.368
12	6 16 30.74	2.5861	26 56 0.2	1.269	12	8 16 59.28	2.3945	24 42 25.0	6.507
13	6 19 5.87	2.5848	26 57 11.0	1.092	13	8 19 22.77	2.3884	24 35 50.5	6.643
14	6 21 40.91	2.5833	26 58 11.2	0.914	14	8 21 45.89	2.3823	24 29 7.9	6.778
15	6 24 15.86	2.5818	26 59 0.7	0.737	15	8 24 8.65	2.3762	24 22 17.2	6.913
16	6 26 50.72	2.5801	26 59 39.6	0.560	16	8 26 31.03	2.3699	24 15 18.4	7.046
17	6 29 25.47	2.5783	27 0 7.9	0.383	17	8 28 53.04	2.3638	24 8 11.7	7.177
18	6 32 0.11	2.5763	27 0 25.6	0.207	18	8 31 14.68	2.3575	24 0 57.2	7.308
19	6 34 34.63	2.5743	27 0 32.7	+0.031	19	8 33 35.94	2.3513	23 53 34.8	7.438
20	6 37 9.02	2.5720	27 0 29.3	-0.144	20	8 35 56.83	2.3450	23 46 4.7	7.565
21	6 39 43.27	2.5697	27 0 15.4	0.319	21	8 38 17.34	2.3386	23 38 27.0	7.692
22	6 42 17.38	2.5673	26 59 51.0	0.493	22	8 40 37.46	2.3322	23 30 41.7	7.817
23	6 44 51.34	2.5647	N. 26 59 16.2	0.667	23	8 42 57.20	2.3258	N. 23 22 49.0	7.940
MONDAY 26.					WEDNESDAY 28.				
0	6 47 25.14	2.5619	N. 26 58 31.0	0.840	0	8 45 16.56	2.3194	N. 23 14 48.9	8.062
1	6 49 58.77	2.5591	26 57 35.4	1.013	1	8 47 35.53	2.3129	23 6 41.5	8.183
2	6 52 32.23	2.5561	26 56 29.4	1.186	2	8 49 54.11	2.3065	22 58 26.9	8.303
3	6 55 5.50	2.5530	26 55 13.1	1.357	3	8 52 12.31	2.3001	22 50 5.1	8.422
4	6 57 38.58	2.5497	26 53 46.6	1.527	4	8 54 30.12	2.2936	22 41 36.3	8.539
5	7 0 11.47	2.5464	26 52 9.9	1.697	5	8 56 47.54	2.2871	22 33 0.4	8.655
6	7 2 44.15	2.5430	26 50 23.0	1.867	6	8 59 4.57	2.2807	22 24 17.7	8.769
7	7 5 16.63	2.5395	26 48 25.9	2.036	7	9 1 21.22	2.2743	22 15 28.1	8.882
8	7 7 48.89	2.5358	26 46 18.7	2.203	8	9 3 37.48	2.2678	22 6 31.8	8.994
9	7 10 20.92	2.5319	26 44 1.5	2.370	9	9 5 53.35	2.2612	21 57 28.8	9.104
10	7 12 52.72	2.5280	26 41 34.3	2.537	10	9 8 8.82	2.2547	21 48 19.3	9.213
11	7 15 24.28	2.5240	26 38 57.1	2.703	11	9 10 23.91	2.2483	21 39 3.3	9.321
12	7 17 55.60	2.5199	26 36 10.0	2.867	12	9 12 38.61	2.2418	21 29 40.8	9.427
13	7 20 26.67	2.5157	26 33 13.1	3.030	13	9 14 52.92	2.2353	21 20 12.0	9.532
14	7 22 57.48	2.5113	26 30 6.4	3.193	14	9 17 6.84	2.2288	21 10 37.0	9.635
15	7 25 28.02	2.5068	26 26 49.9	3.355	15	9 19 20.38	2.2224	21 0 55.8	9.738
16	7 27 58.30	2.5023	26 23 23.8	3.516	16	9 21 33.53	2.2160	20 51 8.5	9.838
17	7 30 28.30	2.4977	26 19 48.0	3.676	17	9 23 46.30	2.2096	20 41 15.2	9.938
18	7 32 58.02	2.4929	26 16 2.7	3.834	18	9 25 58.68	2.2032	20 31 16.0	10.035
19	7 35 27.45	2.4881	26 12 7.9	3.993	19	9 28 10.68	2.1968	20 21 11.0	10.132
20	7 37 56.59	2.4833	26 8 3.6	4.150	20	9 30 22.30	2.1904	20 11 0.2	10.228
21	7 40 25.44	2.4783	26 3 49.9	4.306	21	9 32 33.53	2.1841	20 0 43.7	10.322
22	7 42 53.98	2.4732	25 59 26.9	4.460	22	9 34 44.38	2.1778	19 50 21.6	10.414
23	7 45 22.22	2.4680	25 54 54.7	4.613	23	9 36 54.86	2.1715	19 39 54.0	10.506
24	7 47 50.14	2.4628	N. 25 50 13.3	4.766	24	9 39 4.96	2.1653	N. 19 29 20.9	10.596

GREENWICH MEAN TIME.																				
THE MOON'S RIGHT ASCENSION AND DECLINATION.																				
Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.			Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.							
THURSDAY 29.							SATURDAY, OCTOBER 1.													
0	h	m	s	"	"	"	0	h	m	s	"	"	"							
1	9	39	4.96	2.1653	N. 19 29 20.9	10.596	1	11	16	36.44	1.9186	N. 9 41 14.2	13.449							
2	9	41	14.69	2.1591	19 18 42.5	10.684	PHASES OF THE MOON.													
3	9	43	24.05	2.1528	19 7 58.8	10.772														
4	9	45	33.03	2.1466	18 57 9.9	10.858														
5	9	47	41.64	2.1405	18 46 15.9	10.943														
6	9	49	49.89	2.1344	18 35 16.8	11.026														
7	9	51	57.77	2.1283	18 24 12.8	11.107														
8	9	54	5.29	2.1223	18 13 3.9	11.188														
9	9	56	12.45	2.1163	18 1 50.2	11.268														
10	9	58	19.25	2.1104	17 50 31.8	11.346														
11	10	0	25.70	2.1046	17 39 8.7	11.423														
12	10	2	31.80	2.0987	17 27 41.0	11.499	● New Moon . . . . . Sept. 3 6 5.7 ☾ First Quarter . . . . . 11 8 10.6 ○ Full Moon . . . . . 18 16 52.3 ☾ Last Quarter . . . . . 25 8 53.7													
13	10	4	37.54	2.0928	17 16 8.8	11.573														
14	10	6	42.93	2.0870	17 4 32.2	11.646														
15	10	8	47.98	2.0813	16 52 51.3	11.718														
16	10	10	52.69	2.0757	16 41 6.1	11.788														
17	10	12	57.06	2.0700	16 29 16.7	11.858														
18	10	15	1.09	2.0643	16 17 23.2	11.926														
19	10	17	4.78	2.0588	16 5 25.6	11.993														
20	10	19	8.14	2.0533	15 53 24.1	12.058														
21	10	21	11.18	2.0479	15 41 18.7	12.123								☾ Apogee . . . . . Sept. 9 1.8 ☾ Perigee . . . . . 20 22.4						
22	10	23	13.89	2.0425	15 29 9.4	12.186														
23	10	25	16.28	2.0372	15 16 56.4	12.248														
24	10	27	18.35	2.0318	N. 15 4 39.7	12.308														
FRIDAY 30.																				
0	10	29	20.10	2.0266	N. 14 52 19.4	12.368														
1	10	31	21.54	2.0214	14 39 55.6	12.426														
2	10	33	22.67	2.0163	14 27 28.3	12.483														
3	10	35	23.50	2.0113	14 14 57.7	12.538														
4	10	37	24.02	2.0062	14 2 23.7	12.593														
5	10	39	24.24	2.0013	13 49 46.5	12.647														
6	10	41	24.17	1.9964	13 37 6.1	12.699														
7	10	43	23.81	1.9916	13 24 22.6	12.750														
8	10	45	23.16	1.9868	13 11 36.1	12.800														
9	10	47	22.23	1.9821	12 58 46.6	12.849														
10	10	49	21.01	1.9773	12 45 54.2	12.897														
11	10	51	19.51	1.9727	12 32 59.0	12.943														
12	10	53	17.74	1.9683	12 20 1.0	12.988														
13	10	55	15.70	1.9638	12 7 0.4	13.033														
14	10	57	13.39	1.9593	11 53 57.1	13.077														
15	10	59	10.82	1.9550	11 40 51.2	13.118														
16	11	1	7.99	1.9507	11 27 42.9	13.159														
17	11	3	4.90	1.9464	11 14 32.1	13.199														
18	11	5	1.56	1.9423	11 1 19.0	13.238														
19	11	6	57.97	1.9382	10 48 3.6	13.276														
20	11	8	54.14	1.9342	10 34 45.9	13.313														
21	11	10	50.07	1.9302	10 21 26.1	13.348														
22	11	12	45.76	1.9262	10 8 4.2	13.383														
23	11	14	41.21	1.9223	9 54 40.2	13.417														
24	11	16	36.44	1.9186	N. 9 41 14.2	13.449														

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
5	SUN	W.	20 42 23	3340	22 5 48	3339	23 29 14	3340	24 52 39	3341
	Antares	E.	66 34 57	2878	65 2 10	2888	63 29 36	2898	61 57 15	2908
	α Aquilæ	E.	112 10 26	3846	110 56 11	3835	109 41 45	3826	108 27 10	3819
6	SUN	W.	31 49 5	3360	33 12 7	3365	34 35 3	3371	35 57 52	3377
	Antares	E.	54 18 33	2955	52 47 24	2964	51 16 27	2973	49 45 40	2981
	α Aquilæ	E.	102 12 51	3803	100 57 51	3802	99 42 51	3803	98 27 52	3804
7	SUN	W.	42 50 17	3407	44 12 26	3413	45 34 28	3418	46 56 24	3423
	Antares	E.	42 14 23	3022	40 44 37	3030	39 15 1	3037	37 45 34	3043
	α Aquilæ	E.	92 13 38	3824	90 59 1	3830	89 44 30	3837	88 30 6	3844
8	SUN	W.	53 44 40	3446	55 6 4	3449	56 27 25	3452	57 48 42	3455
	JUPITER	W.	22 21 33	3140	23 48 54	3143	25 16 12	3145	26 43 28	3147
	Spica	W.	16 24 0	3209	17 49 58	3193	19 16 17	3178	20 42 53	3165
	Antares	E.	30 20 24	3077	28 51 47	3083	27 23 17	3090	25 54 55	3097
	α Aquilæ	E.	82 20 9	3889	81 6 38	3900	79 53 19	3912	78 40 11	3924
	Fomalhaut	E.	112 39 30	3256	111 14 27	3256	109 49 24	3256	108 24 21	3256
9	SUN	W.	64 34 30	3463	65 55 35	3464	67 16 39	3463	68 37 44	3463
	JUPITER	W.	33 59 14	3153	35 26 19	3153	36 53 24	3153	38 20 29	3153
	Spica	W.	27 58 45	3131	29 26 17	3126	30 53 55	3122	32 21 38	3118
	α Aquilæ	E.	72 37 50	3997	71 26 7	4013	70 14 40	4031	69 3 31	4050
	Fomalhaut	E.	101 18 59	3253	99 53 52	3252	98 28 45	3251	97 3 36	3250
	α Pegasi	E.	119 43 46	3590	118 25 1	3577	117 6 2	3565	115 46 49	3553
10	SUN	W.	75 23 27	3453	76 44 43	3449	78 6 4	3445	79 27 29	3441
	JUPITER	W.	45 36 14	3143	47 3 31	3140	48 30 52	3137	49 58 17	3133
	Spica	W.	39 41 24	3097	41 9 37	3092	42 37 56	3087	44 6 22	3082
	α Aquilæ	E.	63 12 51	4166	62 3 53	4194	60 55 21	4223	59 47 17	4255
	Fomalhaut	E.	89 57 23	3239	88 32 0	3236	87 6 34	3233	85 41 4	3230
	α Pegasi	E.	109 7 32	3497	107 47 4	3487	106 26 26	3477	105 5 36	3468
11	SUN	W.	86 16 0	3411	87 38 4	3404	89 0 16	3396	90 22 37	3387
	JUPITER	W.	57 16 49	3104	58 44 53	3097	60 13 6	3090	61 41 27	3082
	Spica	W.	51 30 17	3049	52 59 29	3042	54 28 50	3034	55 58 21	3025
	α Aquilæ	E.	54 15 14	4459	53 10 46	4510	52 7 3	4566	51 4 9	4628
	Fomalhaut	E.	78 32 33	3210	77 6 36	3206	75 40 34	3201	74 14 26	3197
	α Pegasi	E.	98 18 47	3420	96 56 53	3411	95 34 49	3402	94 12 34	3393
12	SUN	W.	97 16 59	3338	98 40 27	3327	100 4 7	3315	101 28 1	3302
	JUPITER	W.	69 5 51	3036	70 35 19	3025	72 5 0	3014	73 34 55	3002
	Spica	W.	63 28 44	2977	64 59 25	2966	66 30 20	2954	68 1 30	2943
	Antares	E.	17 39 17	3022	19 9 3	3004	20 39 11	2986	22 9 41	2969
	Fomalhaut	E.	67 2 15	3170	65 35 30	3164	64 8 38	3159	62 41 40	3154
	α Pegasi	E.	87 18 43	3347	85 55 25	3338	84 31 57	3329	83 8 19	3320
13	SUN	W.	108 31 15	3236	109 56 42	3221	111 22 26	3206	112 48 27	3191
	JUPITER	W.	81 8 18	2939	82 39 47	2926	84 11 33	2912	85 43 37	2898
	Spica	W.	75 41 8	2880	77 13 53	2866	78 46 55	2852	80 20 15	2838
	Antares	W.	29 47 25	2889	31 19 58	2874	32 52 50	2858	34 26 3	2842
	Fomalhaut	E.	55 25 25	3133	53 57 55	3130	52 30 21	3128	51 2 45	3127



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
5	SUN W.	26 16 3	3343	27 39 25	3346	29 2 43	3350	30 25 57	3355
	Antares E.	60 25 7	2918	58 53 11	2927	57 21 26	2937	55 49 54	2946
	α Aquilæ E.	107 12 27	3813	105 57 38	3809	104 42 45	3806	103 27 49	3804
6	SUN W.	37 20 35	3383	38 43 11	3389	40 5 40	3395	41 28 2	3401
	Antares E.	48 15 4	2990	46 44 39	2998	45 14 24	3006	43 44 19	3014
	α Aquilæ E.	97 12 54	3807	95 57 59	3811	94 43 8	3815	93 28 21	3819
7	SUN W.	48 18 14	3428	49 39 58	3433	51 1 37	3438	52 23 11	3442
	Antares E.	36 16 15	3050	34 47 5	3057	33 18 3	3064	31 49 9	3071
	α Aquilæ E.	87 15 49	3852	86 1 40	3861	84 47 41	3870	83 33 50	3879
8	SUN W.	59 9 56	3457	60 31 8	3460	61 52 17	3462	63 13 24	3463
	JUPITER W.	28 10 41	3148	29 37 52	3150	31 5 1	3152	32 32 8	3153
	Spica W.	22 9 44	3155	23 36 47	3148	25 3 59	3141	26 31 19	3136
	Antares E.	24 26 42	3105	22 58 38	3112	21 30 43	3119	20 2 56	3126
	α Aquilæ E.	77 27 15	3937	76 14 33	3950	75 2 4	3964	73 49 49	3980
	Fomalhaut E.	106 59 18	3255	105 34 14	3255	104 9 10	3254	102 44 5	3253
9	SUN W.	69 58 49	3462	71 19 55	3461	72 41 3	3459	74 2 14	3456
	JUPITER W.	39 47 34	3152	41 14 41	3151	42 41 49	3149	44 9 0	3146
	Spica W.	33 49 25	3114	35 17 17	3110	36 45 14	3106	38 13 16	3101
	α Aquilæ E.	67 52 41	4070	66 42 10	4092	65 32 1	4115	64 22 14	4140
	Fomalhaut E.	95 38 26	3248	94 13 14	3246	92 48 0	3244	91 22 43	3242
	α Pegasi E.	114 27 23	3541	113 7 44	3529	111 47 52	3518	110 27 48	3507
10	SUN W.	80 48 59	3436	82 10 34	3431	83 32 16	3425	84 54 4	3418
	JUPITER W.	51 25 47	3129	52 53 22	3123	54 21 4	3117	55 48 53	3111
	Spica W.	45 34 54	3076	47 3 33	3070	48 32 20	3063	50 1 14	3056
	α Aquilæ E.	58 39 43	4290	57 32 41	4328	56 26 14	4368	55 20 24	4412
	Fomalhaut E.	84 15 31	3226	82 49 53	3223	81 24 11	3219	79 58 24	3215
	α Pegasi E.	103 44 36	3458	102 23 25	3448	101 2 3	3439	99 40 30	3430
11	SUN W.	91 45 8	3378	93 7 49	3369	94 30 41	3359	95 53 44	3349
	JUPITER W.	63 9 58	3074	64 38 39	3065	66 7 31	3056	67 36 35	3046
	Spica W.	57 28 3	3016	58 57 56	3007	60 28 0	2997	61 58 16	2987
	α Aquilæ E.	50 2 8	4695	49 1 4	4767	48 1 0	4846	47 2 2	4933
	Fomalhaut E.	72 48 13	3191	71 21 53	3186	69 55 27	3180	68 28 54	3175
	α Pegasi E.	92 50 9	3383	91 27 33	3374	90 4 47	3365	88 41 50	3356
12	SUN W.	102 52 10	3290	104 16 33	3277	105 41 11	3264	107 6 5	3250
	JUPITER W.	75 5 5	2990	76 35 30	2978	78 6 10	2965	79 37 6	2952
	Spica W.	69 32 54	2931	71 4 33	2918	72 36 28	2905	74 8 40	2893
	Antares W.	23 40 33	2952	25 11 46	2936	26 43 19	2920	28 15 12	2905
	Fomalhaut E.	61 14 36	3149	59 47 26	3145	58 20 11	3141	56 52 50	3137
	α Pegasi E.	81 44 31	3312	80 20 33	3303	78 56 25	3295	77 32 8	3287
13	SUN W.	114 14 47	3176	115 41 25	3160	117 8 22	3144	118 35 38	3128
	JUPITER W.	87 15 59	2882	88 48 41	2867	90 21 42	2852	91 55 3	2836
	Spica W.	81 53 54	2823	83 27 52	2808	85 2 10	2792	86 36 48	2777
	Antares W.	35 59 36	2826	37 33 30	2810	39 7 44	2794	40 42 20	2778
	Fomalhaut E.	49 35 8	3128	48 7 31	3129	46 39 56	3131	45 12 23	3135

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
13	$\alpha$ Pegasi E.	76 7 41	3279	74 43 5	3271	73 18 20	3264	71 53 26	3257
	SATURN E.	117 22 58	2852	115 49 38	2838	114 16 0	2824	112 42 4	2810
	$\alpha$ Arietis E.	118 15 8	2971	116 44 21	2956	115 13 14	2939	113 41 45	2923
14	SUN W.	120 3 14	3111	121 31 10	3094	122 59 27	3077	124 28 4	3060
	JUPITER W.	93 28 44	2820	95 2 46	2804	96 37 8	2788	98 11 52	2771
	Spica W.	88 11 46	2761	89 47 5	2745	91 22 44	2729	92 58 45	2713
	Antares W.	42 17 17	2761	43 52 36	2745	45 28 16	2728	47 4 19	2711
	Fomalhaut E.	43 44 56	3142	42 17 37	3151	40 50 30	3163	39 23 37	3178
	$\alpha$ Pegasi E.	64 47 17	3234	63 21 49	3232	61 56 17	3231	60 30 45	3231
	SATURN E.	104 47 36	2735	103 11 42	2719	101 35 27	2703	99 58 50	2687
	$\alpha$ Arietis E.	105 59 4	2838	104 25 26	2821	102 51 26	2804	101 17 3	2787
15	JUPITER W.	106 11 2	2687	107 48 0	2669	109 25 21	2652	111 3 5	2635
	Spica W.	101 4 17	2630	102 42 31	2613	104 21 7	2596	106 0 7	2580
	Antares W.	55 10 15	2625	56 48 36	2608	58 27 20	2591	60 6 28	2573
	$\alpha$ Pegasi E.	53 23 48	3259	51 58 49	3272	50 34 5	3288	49 9 39	3307
	SATURN E.	91 50 14	2602	90 11 22	2585	88 32 7	2568	86 52 29	2551
	$\alpha$ Arietis E.	93 19 29	2700	91 42 49	2683	90 5 47	2666	88 28 21	2649
16	Antares W.	68 28 7	2487	70 9 39	2470	71 51 34	2453	73 33 53	2437
	SATURN E.	78 28 23	2466	76 46 22	2450	75 3 58	2433	73 21 10	2417
	$\alpha$ Arietis E.	80 15 33	2567	78 35 52	2551	76 55 50	2536	75 15 26	2521
	Aldebaran E.	110 34 42	2517	108 53 53	2499	107 12 39	2482	105 31 0	2465
17	Antares W.	82 11 14	2358	83 55 50	2343	85 40 47	2328	87 26 6	2314
	$\alpha$ Aquilæ W.	45 7 51	4415	46 12 59	4278	47 20 12	4154	48 29 22	4039
	SATURN E.	64 41 28	2338	62 56 24	2323	61 10 58	2309	59 25 11	2294
	$\alpha$ Arietis E.	66 48 25	2452	65 6 4	2440	63 23 26	2429	61 40 32	2418
	Aldebaran E.	96 56 55	2384	95 12 58	2369	93 28 39	2354	91 43 58	2340
18	Antares W.	96 17 44	2248	98 5 0	2236	99 52 34	2225	101 40 25	2214
	$\alpha$ Aquilæ W.	54 40 39	3597	55 59 17	3528	57 19 10	3464	58 40 14	3406
	SATURN E.	50 31 12	2229	48 43 28	2217	46 55 26	2206	45 7 8	2195
	$\alpha$ Arietis E.	53 2 33	2377	51 18 25	2373	49 34 11	2369	47 49 51	2366
	Aldebaran E.	82 55 37	2275	81 9 1	2264	79 22 8	2253	77 34 59	2243
19	$\alpha$ Aquilæ W.	65 40 32	3178	67 7 7	3144	68 34 23	3112	70 2 17	3083
	Fomalhaut W.	31 25 4	2849	32 58 28	2779	34 33 23	2717	36 9 40	2662
	SATURN E.	36 1 49	2150	34 12 6	2143	32 22 12	2136	30 32 8	2130
	Aldebaran E.	68 35 41	2200	66 47 13	2193	64 58 35	2187	63 9 48	2182
	Pollux E.	112 34 0	2166	110 44 41	2157	108 55 9	2150	107 5 26	2144
20	$\alpha$ Aquilæ W.	77 29 33	2980	79 0 11	2965	80 31 7	2954	82 2 17	2945
	Fomalhaut W.	44 26 48	2477	46 8 34	2452	47 50 55	2431	49 33 46	2412
	Aldebaran E.	54 4 22	2169	52 15 7	2158	50 25 51	2169	48 36 36	2170
	Pollux E.	97 54 42	2120	96 4 13	2117	94 13 40	2115	92 23 3	2113
21	$\alpha$ Aquilæ W.	89 40 10	2930	91 11 51	2932	92 43 29	2937	94 15 1	2943
	Fomalhaut W.	58 13 42	2349	59 58 30	2342	61 43 28	2337	63 28 34	2333
	Aldebaran E.	39 31 30	2196	37 42 56	2204	35 54 35	2214	34 6 29	2227
	Pollux E.	83 9 36	2113	81 18 56	2115	79 28 19	2117	77 37 45	2120

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
13	<i>α</i> Pegasi E.	70 28 24	3251	69 3 15	3246	67 38 1	3242	66 12 41	3238
	SATURN E.	111 7 49	2795	109 33 15	2781	107 58 22	2766	106 23 9	2750
	<i>α</i> Arietis E.	112 9 56	2906	110 37 45	2890	109 5 13	2873	107 32 19	2856
14	SUN W.	125 57 2	3043	127 26 21	3026	128 56 1	3009	130 26 3	2991
	JUPITER W.	99 46 58	2735	101 22 25	2738	102 58 15	2721	104 34 27	2704
	Spica W.	94 35 7	2697	96 11 51	2680	97 48 57	2663	99 26 26	2647
	Antares W.	48 40 44	2694	50 17 32	2677	51 54 43	2660	53 32 18	2643
	Fomalhaut E.	37 57 1	3197	36 30 48	3223	35 5 6	3253	33 40 0	3289
	<i>α</i> Pegasi E.	59 5 13	3233	57 39 43	3237	56 14 18	3242	54 48 59	3249
	SATURN E.	98 21 52	2670	96 44 31	2653	95 6 48	2636	93 28 42	2619
	<i>α</i> Arietis E.	99 42 18	2769	98 7 10	2752	96 31 39	2735	94 55 45	2718
15	JUPITER W.	112 41 13	2618	114 19 44	2601	115 58 38	2583	117 37 56	2566
	Spica W.	107 39 30	2563	109 19 16	2546	110 59 25	2529	112 39 58	2512
	Antares W.	61 46 0	2556	63 25 56	2538	65 6 16	2521	66 47 0	2504
	<i>α</i> Pegasi E.	47 45 36	3331	46 22 0	3358	44 58 56	3391	43 36 30	3430
	SATURN E.	85 12 27	2534	83 32 1	2517	81 51 12	2500	80 10 0	2483
	<i>α</i> Arietis E.	86 50 33	2632	85 12 22	2615	83 33 48	2599	81 54 52	2583
16	Antares W.	75 16 35	2421	76 59 41	2405	78 43 9	2389	80 27 0	2373
	SATURN E.	71 38 0	2401	69 54 26	2385	68 10 29	2369	66 26 10	2353
	<i>α</i> Arietis E.	73 34 42	2506	71 53 37	2492	70 12 12	2478	68 30 28	2465
	Aldebaran E.	103 48 58	2448	102 6 32	2432	100 23 43	2416	98 40 30	2400
17	Antares W.	89 11 45	2300	90 57 45	2286	92 44 6	2273	94 30 46	2260
	<i>α</i> Aquilæ W.	49 40 23	3935	50 53 7	3840	52 7 28	3751	53 23 21	3671
	SATURN E.	57 39 3	2280	55 52 34	2267	54 5 46	2254	52 18 38	2241
	<i>α</i> Arietis E.	59 57 22	2407	58 13 57	2399	56 30 20	2391	54 46 32	2383
	Aldebaran E.	89 58 57	2326	88 13 36	2313	86 27 55	2300	84 41 55	2287
18	Antares W.	103 28 31	2204	105 16 53	2194	107 5 29	2185	108 54 19	2176
	<i>α</i> Aquilæ W.	60 2 24	3352	61 25 35	3303	62 49 42	3258	64 14 42	3216
	SATURN E.	43 18 33	2185	41 29 43	2176	39 40 39	2167	37 51 21	2158
	<i>α</i> Arietis E.	46 5 28	2366	44 21 5	2367	42 36 43	2371	40 52 26	2376
	Aldebaran E.	75 47 35	2233	73 59 56	2224	72 12 4	2215	70 23 59	2207
19	<i>α</i> Aquilæ W.	71 30 47	3057	72 59 49	3034	74 29 19	3014	75 59 15	2996
	Fomalhaut W.	37 47 11	2614	39 25 47	2573	41 5 19	2537	42 45 41	2505
	SATURN E.	28 41 55	2125	26 51 34	2120	25 1 6	2117	23 10 32	2114
	Aldebaran E.	61 20 54	2178	59 31 53	2174	57 42 46	2170	55 53 35	2167
	Pollux E.	105 15 34	2138	103 25 33	2133	101 35 23	2128	99 45 6	2124
20	<i>α</i> Aquilæ W.	83 33 39	2938	85 5 10	2933	86 36 47	2930	88 8 28	2929
	Fomalhaut W.	51 17 4	2396	53 0 45	2381	54 44 47	2368	56 29 7	2358
	Aldebaran E.	46 47 24	2172	44 58 15	2176	43 9 12	2181	41 20 16	2188
	Pollux E.	90 32 24	2112	88 41 42	2111	86 51 0	2111	85 0 18	2112
21	<i>α</i> Aquilæ W.	95 46 25	2952	97 17 38	2963	98 48 36	2976	100 19 19	2990
	Fomalhaut W.	65 13 46	2330	66 59 3	2328	68 44 22	2326	70 29 43	2326
	Aldebaran E.	32 18 43	2243	30 31 20	2261	28 44 23	2283	26 57 58	2309
	Pollux E.	75 47 16	2123	73 56 52	2126	72 6 33	2130	70 16 20	2135

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	III <sup>h</sup>	P. L. of Diff.	VI <sup>h</sup>	P. L. of Diff.	IX <sup>h</sup>	P. L. of Diff.
21	Regulus E.	119 29 25	2128	117 39 8	2129	115 48 53	2131	113 58 40	2133
22	α Aquilæ W.	101 49 44	3007	103 19 48	3027	104 49 27	3048	106 18 40	3072
	Fomalhaut W.	72 15 5	2327	74 0 25	2330	75 45 41	2333	77 30 52	2337
	α Pegasi W.	54 18 54	2735	55 54 48	2716	57 31 6	2699	59 7 47	2685
	Pollux E.	68 26 15	2141	66 36 18	2147	64 46 29	2153	62 56 50	2159
	Regulus E.	104 48 45	2153	102 59 6	2157	101 9 34	2163	99 20 11	2169
	SUN E.	134 49 7	2458	133 6 55	2464	131 24 51	2469	129 42 54	2475
23	Fomalhaut W.	86 15 7	2367	87 59 30	2375	89 43 41	2384	91 27 40	2393
	α Pegasi W.	67 14 58	2646	68 52 50	2643	70 30 46	2642	72 8 44	2643
	SATURN W.	23 0 30	2182	24 49 24	2190	26 38 6	2198	28 26 36	2207
	Pollux E.	53 51 13	2198	52 2 42	2206	50 14 23	2215	48 26 18	2224
	Regulus E.	90 15 49	2206	88 27 31	2215	86 39 26	2224	84 51 34	2233
	SUN E.	121 15 29	2512	119 34 32	2520	117 53 46	2529	116 13 13	2538
24	Fomalhaut W.	100 3 58	2447	101 46 25	2460	103 28 35	2473	105 10 27	2487
	α Pegasi W.	80 17 52	2662	81 55 23	2669	83 32 45	2676	85 9 57	2684
	SATURN W.	37 25 50	2253	39 12 59	2262	40 59 54	2272	42 46 34	2283
	α Arietis W.	36 52 33	2496	38 33 52	2489	40 15 21	2485	41 56 56	2482
	Pollux E.	39 29 26	2275	37 42 50	2286	35 56 29	2297	34 10 25	2308
	Regulus E.	75 55 44	2282	74 9 18	2293	72 23 8	2303	70 37 13	2314
	SUN E.	107 53 46	2588	106 14 35	2599	104 35 38	2610	102 56 56	2621
25	α Pegasi W.	93 12 47	2738	94 48 36	2751	96 24 8	2765	97 59 22	2780
	SATURN W.	51 36 6	2335	53 21 14	2346	55 6 6	2357	56 50 43	2367
	α Arietis W.	50 25 2	2489	52 6 30	2494	53 47 51	2500	55 29 5	2506
	Regulus E.	61 51 40	2371	60 7 23	2382	58 23 22	2394	56 39 38	2405
	SUN E.	94 47 18	2678	93 10 9	2689	91 33 15	2701	89 56 37	2713
26	SATURN W.	65 29 55	2422	67 12 59	2433	68 55 47	2443	70 38 20	2454
	α Arietis W.	63 52 58	2541	65 33 14	2550	67 13 18	2558	68 53 11	2566
	Aldebaran W.	33 21 22	2545	35 1 32	2548	36 41 39	2552	38 21 42	2556
	SUN E.	81 57 21	2772	80 22 17	2784	78 47 28	2795	77 12 54	2807
27	SATURN W.	79 7 23	2506	80 48 28	2517	82 29 18	2527	84 9 54	2537
	α Arietis W.	77 9 34	2612	78 48 13	2621	80 26 39	2630	82 4 53	2640
	Aldebaran W.	46 40 5	2586	48 19 19	2593	49 58 23	2601	51 37 17	2609
	SUN E.	69 23 52	2865	67 50 48	2876	66 18 0	2887	64 45 25	2899
28	SATURN W.	92 29 26	2586	94 8 40	2596	95 47 41	2605	97 26 29	2615
	α Arietis W.	90 12 46	2688	91 49 42	2698	93 26 24	2708	95 2 53	2718
	Aldebaran W.	59 49 5	2649	61 26 53	2657	63 4 30	2666	64 41 56	2675
	SUN E.	57 6 5	2954	55 34 55	2965	54 3 58	2976	52 33 15	2986
29	SATURN W.	105 37 17	2661	107 14 49	2669	108 52 10	2678	110 29 19	2687
	α Arietis W.	103 1 59	2769	104 37 8	2779	106 12 4	2789	107 46 46	2800
	Aldebaran W.	72 46 13	2716	74 22 31	2725	75 58 37	2734	77 34 32	2742
	SUN E.	45 3 0	3039	43 33 36	3050	42 4 26	3061	40 35 29	3072
30	Aldebaran W.	85 31 20	2784	87 6 8	2792	88 40 46	2801	90 15 12	2809
	SUN E.	33 14 1	3127	31 46 24	3138	30 19 0	3150	28 51 50	3162

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
21	Regulus E.	112 8 31	2136	110 18 26	2139	108 28 26	2143	106 38 32	2148
22	α Aquilæ W.	107 47 24	2098	109 15 37	2126	110 43 15	2157	112 10 16	2190
	Fomalhaut W.	79 15 58	2342	81 0 57	2346	82 45 49	2352	84 30 33	2359
	α Pegasi W.	60 44 48	2673	62 22 4	2664	63 59 32	2656	65 37 11	2650
	Pollux E.	61 7 21	2166	59 18 2	2173	57 28 54	2180	55 39 57	2189
	Regulus E.	97 30 57	2176	95 41 54	2183	93 53 1	2190	92 4 19	2198
	SUN E.	128 1 6	2482	126 19 27	2488	124 37 57	2496	122 56 38	2504
23	Fomalhaut W.	93 11 25	2403	94 54 56	2413	96 38 12	2424	98 21 13	2435
	α Pegasi W.	73 46 41	2645	75 24 35	2647	77 2 26	2651	78 40 12	2656
	SATURN W.	30 14 53	2216	32 2 57	2225	33 50 48	2234	35 38 26	2243
	Pollux E.	46 38 26	2234	44 50 49	2243	43 3 26	2253	41 16 18	2264
	Regulus E.	83 3 56	2242	81 16 31	2252	79 29 21	2262	77 42 25	2272
	SUN E.	114 32 52	2548	112 52 45	2558	111 12 51	2568	109 33 12	2578
24	Fomalhaut W.	106 51 59	2501	108 33 12	2515	110 14 4	2530	111 54 35	2546
	α Pegasi W.	86 46 58	2694	88 23 46	2704	90 0 21	2715	91 36 42	2726
	SATURN W.	44 32 59	2293	46 19 9	2304	48 5 3	2314	49 50 42	2324
	α Arietis W.	43 38 34	2482	45 20 13	2482	47 1 52	2483	48 43 29	2486
	Pollux E.	32 24 37	2320	30 39 6	2332	28 53 53	2344	27 8 57	2356
	Regulus E.	68 51 34	2325	67 6 12	2336	65 21 5	2347	63 36 14	2359
	SUN E.	101 18 30	2632	99 40 19	2643	98 2 23	2655	96 24 43	2666
25	α Pegasi W.	99 34 17	2795	101 8 52	2811	102 43 7	2827	104 17 0	2843
	SATURN W.	58 35 5	2378	60 19 11	2389	62 3 1	2400	63 46 36	2411
	α Arietis W.	57 10 10	2512	58 51 7	2519	60 31 54	2526	62 12 31	2533
	Regulus E.	54 56 11	2417	53 13 1	2429	51 30 8	2441	49 47 32	2453
	SUN E.	88 20 14	2725	86 44 8	2737	85 8 17	2748	83 32 41	2760
26	SATURN W.	72 20 38	2465	74 2 41	2475	75 44 30	2485	77 26 4	2496
	α Arietis W.	70 32 52	2575	72 12 21	2584	73 51 38	2593	75 30 42	2602
	Aldebaran W.	40 1 38	2561	41 41 27	2566	43 21 8	2572	45 0 41	2579
	SUN E.	75 38 35	2819	74 4 31	2831	72 30 43	2842	70 57 10	2854
27	SATURN W.	85 50 16	2547	87 30 24	2557	89 10 18	2567	90 49 59	2577
	α Arietis W.	83 42 54	2650	85 20 42	2660	86 58 16	2669	88 35 38	2679
	Aldebaran W.	53 16 0	2617	54 54 33	2625	56 32 54	2632	58 11 5	2640
	SUN E.	63 13 5	2910	61 40 59	2921	60 9 7	2932	58 37 29	2943
28	SATURN W.	99 5 4	2624	100 43 26	2634	102 21 35	2643	103 59 32	2652
	α Arietis W.	96 39 9	2728	98 15 12	2738	99 51 1	2748	101 26 37	2759
	Aldebaran W.	66 19 10	2683	67 56 13	2692	69 33 4	2700	71 9 44	2708
	SUN E.	51 2 45	2997	49 32 29	3008	48 2 26	3019	46 32 36	3029
29	SATURN W.	112 6 16	2696	113 43 1	2704	115 19 35	2713	116 55 57	2722
	α Arietis W.	109 21 14	2811	110 55 28	2821	112 29 28	2832	114 3 14	2842
	Aldebaran W.	79 10 16	2751	80 45 49	2760	82 21 10	2768	83 56 20	2776
	SUN E.	39 6 45	3082	37 38 14	3093	36 9 56	3104	34 41 52	3115
30	Aldebaran W.	91 49 28	2818	93 23 32	2826	94 57 26	2834	96 31 9	2842
	SUN E.	27 24 55	3174	25 58 15	3187	24 31 50	3201	23 5 41	3215

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.			
		h m s	s	° ' "	"	' "	s	m s	s
Sat.	1	12 27 14.53	9.050	S. 2 56 41.3	-58.31	16 0.64	64.29	10 5.16	0.804
SUN.	2	12 30 51.86	9.062	3 20 0.2	58.24	16 0.91	64.33	10 24.31	0.792
Mon.	3	12 34 29.51	9.075	3 43 16.9	58.14	16 1.18	64.37	10 43.17	0.779
Tues.	4	12 38 7.48	9.088	4 6 31.1	-58.03	16 1.46	64.42	11 1.72	0.766
Wed.	5	12 41 45.77	9.102	4 29 42.3	57.90	16 1.74	64.47	11 19.94	0.751
Thur.	6	12 45 24.41	9.118	4 52 50.2	57.75	16 2.01	64.53	11 37.80	0.736
Frid.	7	12 49 3.42	9.133	5 15 54.5	-57.58	16 2.29	64.59	11 55.28	0.720
Sat.	8	12 52 42.82	9.150	5 38 54.8	57.41	16 2.57	64.65	12 12.38	0.704
SUN.	9	12 56 22.63	9.167	6 1 50.5	57.22	16 2.86	64.71	12 29.09	0.687
Mon.	10	13 0 2.86	9.185	6 24 41.4	-57.01	16 3.14	64.78	12 45.38	0.669
Tues.	11	13 3 43.53	9.204	6 47 27.1	56.78	16 3.42	64.85	13 1.22	0.650
Wed.	12	13 7 24.66	9.224	7 10 7.2	56.54	16 3.71	64.92	13 16.60	0.631
Thur.	13	13 11 6.26	9.244	7 32 41.4	-56.29	16 3.99	64.99	13 31.51	0.610
Frid.	14	13 14 48.36	9.265	7 55 9.3	56.02	16 4.27	65.07	13 45.92	0.589
Sat.	15	13 18 30.99	9.287	8 17 30.5	55.73	16 4.55	65.15	13 59.82	0.567
SUN.	16	13 22 14.15	9.310	8 39 44.6	-55.43	16 4.83	65.23	14 13.18	0.545
Mon.	17	13 25 57.86	9.333	9 1 51.2	55.11	16 5.10	65.31	14 25.98	0.521
Tues.	18	13 29 42.15	9.358	9 23 50.0	54.78	16 5.38	65.40	14 38.20	0.497
Wed.	19	13 33 27.04	9.384	9 45 40.7	-54.43	16 5.65	65.49	14 49.83	0.471
Thur.	20	13 37 12.56	9.410	10 7 22.9	54.07	16 5.92	65.58	15 0.83	0.445
Frid.	21	13 40 58.73	9.437	10 28 56.2	53.69	16 6.18	65.67	15 11.20	0.417
Sat.	22	13 44 45.56	9.465	10 50 20.3	-53.30	16 6.45	65.77	15 20.91	0.389
SUN.	23	13 48 33.07	9.494	11 11 35.0	52.89	16 6.71	65.87	15 29.93	0.360
Mon.	24	13 52 21.28	9.524	11 32 39.8	52.47	16 6.97	65.97	15 38.25	0.331
Tues.	25	13 56 10.21	9.554	11 53 34.1	-52.03	16 7.22	66.07	15 45.85	0.301
Wed.	26	13 59 59.87	9.585	12 14 17.6	51.57	16 7.48	66.18	15 52.72	0.271
Thur.	27	14 3 50.27	9.616	12 34 50.0	51.10	16 7.74	66.28	15 58.85	0.240
Frid.	28	14 7 41.43	9.647	12 55 11.0	-50.62	16 8.00	66.39	16 4.23	0.208
Sat.	29	14 11 33.35	9.679	13 15 20.0	50.11	16 8.25	66.50	16 8.85	0.176
SUN.	30	14 15 26.05	9.712	13 35 16.4	49.58	16 8.50	66.61	16 12.70	0.143
Mon.	31	14 19 19.54	9.745	13 55 0.0	49.04	16 8.75	66.72	16 15.77	0.110
Tues.	32	14 23 13.80	9.778	S. 14 14 30.4	-48.48	16 9.00	66.83	16 18.05	0.078

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0.18 from the sidereal time.  
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Sat. <i>SUN.</i>	1	12 27 16.05	9.053	S. 2 56 51.1	-58.33	10 5.30	0.804	12 37 21.34
Mon.	2	12 30 53.44	9.065	3 20 10.2	58.25	10 24.46	0.792	12 41 17.90
	3	12 34 31.13	9.077	3 43 27.3	58.15	10 43.32	0.779	12 45 14.45
Tues.	4	12 38 9.14	9.090	4 6 41.7	-58.04	11 1.87	0.766	12 49 11.01
Wed.	5	12 41 47.48	9.105	4 29 53.2	57.91	11 20.08	0.751	12 53 7.56
Thur.	6	12 45 26.17	9.120	4 53 1.4	57.76	11 37.94	0.736	12 57 4.11
Frid.	7	12 49 5.23	9.136	5 16 5.9	-57.60	11 55.43	0.720	13 1 0.66
Sat. <i>SUN.</i>	8	12 52 44.68	9.152	5 39 6.4	57.42	12 12.54	0.704	13 4 57.22
	9	12 56 24.53	9.169	6 2 2.4	57.23	12 29.24	0.687	13 8 53.77
Mon.	10	13 0 4.80	9.187	6 24 53.5	-57.02	12 45.52	0.669	13 12 50.33
Tues.	11	13 3 45.52	9.206	6 47 39.5	56.79	13 1.36	0.650	13 16 46.88
Wed.	12	13 7 26.69	9.225	7 10 19.7	56.55	13 16.74	0.631	13 20 43.43
Thur.	13	13 11 8.33	9.246	7 32 54.0	-56.29	13 31.65	0.610	13 24 39.99
Frid.	14	13 14 50.48	9.267	7 55 22.1	56.02	13 46.06	0.589	13 28 36.54
Sat.	15	13 18 33.15	9.289	8 17 43.4	55.73	13 59.95	0.567	13 32 33.10
<i>SUN.</i>	16	13 22 16.35	9.312	8 39 57.7	-55.43	14 13.30	0.545	13 36 29.65
Mon.	17	13 26 0.10	9.336	9 2 4.4	55.11	14 26.10	0.521	13 40 26.21
Tues.	18	13 29 44.43	9.360	9 24 3.3	54.78	14 38.33	0.497	13 44 22.76
Wed.	19	13 33 29.36	9.386	9 45 54.1	-54.43	14 49.96	0.471	13 48 19.31
Thur.	20	13 37 14.91	9.412	10 7 36.4	54.07	15 0.96	0.445	13 52 15.87
Frid.	21	13 41 1.11	9.439	10 29 9.8	53.69	15 11.31	0.417	13 56 12.42
Sat. <i>SUN.</i>	22	13 44 47.98	9.467	10 50 34.0	-53.30	15 21.00	0.389	14 0 8.98
Mon.	23	13 48 35.52	9.496	11 11 48.7	52.90	15 30.01	0.360	14 4 5.53
	24	13 52 23.76	9.525	11 32 53.5	52.48	15 38.32	0.331	14 8 2.08
Tues.	25	13 56 12.72	9.555	11 53 47.8	-52.04	15 45.92	0.301	14 11 58.64
Wed.	26	14 0 2.40	9.585	12 14 31.2	51.58	15 52.79	0.271	14 15 55.19
Thur.	27	14 3 52.83	9.616	12 35 3.6	51.10	15 58.91	0.240	14 19 51.74
Frid.	28	14 7 44.01	9.648	12 55 24.5	-50.61	16 4.29	0.208	14 23 48.30
Sat. <i>SUN.</i>	29	14 11 35.95	9.680	13 15 33.4	50.10	16 8.91	0.176	14 27 44.86
Mon.	30	14 15 28.66	9.713	13 35 29.8	49.58	16 12.75	0.143	14 31 41.41
	31	14 19 22.16	9.745	13 55 13.3	49.04	16 15.81	0.110	14 35 37.97
Tues.	32	14 23 16.44	9.778	S. 14 14 43.5	-48.48	16 18.08	0.078	14 39 34.53

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.

The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,  
+ 9°.8565.  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
		$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$	$''$	$^{\circ}$ $'$ $''$			$^h$ $^m$ $^s$
1	274	187 25 46.9	25 23.0	147.62	+ 0.81	0.000 3919	- 51.5	11 20 46.82
2	275	188 24 50.8	24 26.8	147.71	0.74	0.000 2680	51.8	11 16 50.91
3	276	189 23 56.8	23 32.7	147.79	0.65	0.000 1434	52.1	11 12 55.01
4	277	190 23 4.8	22 40.6	147.88	+ 0.54	0.000 0182	- 52.3	11 8 59.10
5	278	191 22 14.8	21 50.5	147.96	0.42	9.999 8924	52.5	11 5 3.19
6	279	192 21 26.7	21 2.3	148.04	0.29	9.999 7660	52.7	11 1 7.28
7	280	193 20 40.5	20 16.0	148.11	+ 0.16	9.999 6392	- 52.9	10 57 11.37
8	281	194 19 56.2	19 31.6	148.19	+ 0.04	9.999 5121	53.0	10 53 15.47
9	282	195 19 13.8	18 49.0	148.27	- 0.07	9.999 3848	53.1	10 49 19.56
10	283	196 18 33.1	18 8.2	148.34	- 0.17	9.999 2574	- 53.1	10 45 23.65
11	284	197 17 54.2	17 29.2	148.42	0.25	9.999 1300	53.0	10 41 27.74
12	285	198 17 17.0	16 52.0	148.49	0.29	9.999 0027	52.9	10 37 31.84
13	286	199 16 41.7	16 16.5	148.56	- 0.31	9.998 8758	- 52.8	10 33 35.93
14	287	200 16 8.1	15 42.8	148.64	0.32	9.998 7494	52.6	10 29 40.02
15	288	201 15 36.3	15 10.9	148.71	0.28	9.998 6237	52.3	10 25 44.11
16	289	202 15 6.3	14 40.8	148.79	- 0.21	9.998 4987	- 51.9	10 21 48.20
17	290	203 14 38.2	14 12.6	148.87	0.12	9.998 3747	51.4	10 17 52.29
18	291	204 14 12.0	13 46.3	148.95	- 0.02	9.998 2517	50.9	10 13 56.39
19	292	205 13 47.8	13 22.0	149.04	+ 0.10	9.998 1299	- 50.4	10 10 0.48
20	293	206 13 25.7	12 59.7	149.12	0.23	9.998 0093	50.0	10 6 4.57
21	294	207 13 5.8	12 39.6	149.21	0.37	9.997 8899	49.5	10 2 8.66
22	295	208 12 48.1	12 21.8	149.31	+ 0.50	9.997 7715	- 49.1	9 58 12.75
23	296	209 12 32.6	12 6.2	149.41	0.61	9.997 6541	48.7	9 54 16.84
24	297	210 12 19.3	11 52.8	149.50	0.69	9.997 5376	48.4	9 50 20.94
25	298	211 12 8.4	11 41.7	149.59	+ 0.75	9.997 4219	- 48.1	9 46 25.03
26	299	212 11 59.7	11 32.9	149.68	0.78	9.997 3069	47.8	9 42 29.12
27	300	213 11 53.2	11 26.3	149.78	0.78	9.997 1924	47.6	9 38 33.21
28	301	214 11 48.9	11 21.9	149.87	+ 0.76	9.997 0785	- 47.4	9 34 37.30
29	302	215 11 46.8	11 19.7	149.95	0.69	9.996 9651	47.2	9 30 41.39
30	303	216 11 46.8	11 19.6	150.04	0.59	9.996 8520	47.0	9 26 45.48
31	304	217 11 48.8	11 21.4	150.12	0.51	9.996 7393	46.9	9 22 49.57
32	305	218 11 52.7	11 25.1	150.20	+ 0.38	9.996 6270	- 46.7	9 18 53.66
NOTE.—The numbers in column $\lambda$ correspond to the true equinox of the date; in column $\lambda'$ to the mean equinox of January 0 <sup>h</sup> .0.								Diff. for 1 Hour, — 0 <sup>h</sup> .8296. (Table II.)



## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.									
	SEMI- DIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
1	15 10.6	15 7.1	55 36.2	- 1.13	55 23.0	- 1.08	23 19.3	1.73	27.7
2	15 3.6	15 0.4	55 10.4	1.01	54 58.6	0.95	0	.	28.7
3	14 57.4	14 54.6	54 47.6	0.88	54 37.5	0.80	0 0.3	1.69	0.1
4	14 52.2	14 50.0	54 28.4	- 0.71	54 20.4	- 0.61	0 41.0	1.70	1.1
5	14 48.1	14 46.7	54 13.6	0.50	54 8.3	0.38	1 22.2	1.74	2.1
6	14 45.7	14 45.1	54 4.6	- 0.24	54 2.6	- 0.09	2 4.7	1.81	3.1
7	14 45.1	14 45.6	54 2.4	+ 0.07	54 4.2	+ 0.24	2 49.3	1.90	4.1
8	14 46.6	14 48.3	54 8.1	0.42	54 14.3	0.61	3 36.4	2.01	5.1
9	14 50.7	14 53.6	54 22.9	0.81	54 33.8	1.01	4 25.9	2.11	6.1
10	14 57.3	15 1.6	54 47.2	+ 1.22	55 3.1	+ 1.42	5 17.6	2.18	7.1
11	15 6.6	15 12.2	55 21.4	1.62	55 42.0	1.81	6 10.4	2.21	8.1
12	15 18.4	15 25.1	56 4.7	1.98	56 29.3	2.13	7 3.3	2.19	9.1
13	15 32.3	15 39.8	56 55.6	+ 2.25	57 23.2	+ 2.34	7 55.6	2.15	10.1
14	15 47.5	15 55.4	57 51.6	2.39	58 20.3	2.39	8 46.7	2.11	11.1
15	16 3.1	16 10.6	58 48.7	2.34	59 16.2	2.23	9 36.9	2.08	12.1
16	16 17.6	16 24.0	59 42.0	+ 2.06	60 5.5	+ 1.83	10 26.7	2.08	13.1
17	16 29.6	16 34.2	60 26.0	1.56	60 42.9	1.24	11 17.2	2.13	14.1
18	16 37.7	16 40.0	60 55.7	0.88	61 4.0	+ 0.50	12 9.4	2.23	15.1
19	16 40.9	16 40.6	61 7.6	+ 0.10	61 6.5	- 0.29	13 4.4	2.36	16.1
20	16 39.1	16 36.4	61 0.8	- 0.66	60 50.8	1.00	14 2.8	2.51	17.1
21	16 32.6	16 27.9	60 36.9	1.30	60 19.7	1.55	15 4.2	2.60	18.1
22	16 22.5	16 16.5	59 59.9	- 1.74	59 38.0	- 1.89	16 7.0	2.61	19.1
23	16 10.1	16 3.5	59 14.5	1.99	58 50.2	2.05	17 8.8	2.52	20.1
24	15 56.8	15 50.1	58 25.6	2.05	58 1.0	2.03	18 7.2	2.34	21.1
25	15 43.6	15 37.2	57 36.9	- 1.97	57 13.7	- 1.89	19 1.1	2.15	22.1
26	15 31.2	15 25.4	56 51.5	1.80	56 30.5	1.70	19 50.5	1.97	23.1
27	15 20.1	15 15.1	56 10.8	1.58	55 52.6	1.46	20 35.9	1.83	24.1
28	15 10.5	15 6.3	55 35.8	- 1.34	55 20.4	- 1.22	21 18.5	1.73	25.1
29	15 2.6	14 59.1	55 6.5	1.11	54 53.9	1.00	21 59.5	1.68	26.1
30	14 56.0	14 53.3	54 42.6	0.89	54 32.6	0.78	22 39.7	1.68	27.1
31	14 50.9	14 48.9	54 23.8	0.68	54 16.3	0.58	23 20.4	1.71	28.1
32	14 47.1	14 45.7	54 9.9	- 0.48	54 4.8	- 0.38	0	.	29.1

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 1.					MONDAY 3.				
0	11 16 36.44	1.9186	N. 9 41 14.2	13.449	0	12 45 34.26	1.8133	S. 1 22 59.9	13.873
1	11 18 31.44	1.9148	9 27 46.3	13.480	1	12 47 23.04	1.8128	1 36 51.9	13.861
2	11 20 26.22	1.9112	9 14 16.6	13.510	2	12 49 11.79	1.8123	1 50 43.2	13.848
3	11 22 20.78	1.9076	9 0 45.1	13.539	3	12 51 0.51	1.8118	2 4 33.6	13.833
4	11 24 15.13	1.9040	8 47 11.9	13.568	4	12 52 49.20	1.8113	2 18 23.1	13.818
5	11 26 9.26	1.9005	8 33 37.0	13.595	5	12 54 37.87	1.8110	2 32 11.7	13.802
6	11 28 3.19	1.8972	8 20 0.5	13.622	6	12 56 26.52	1.8107	2 45 59.3	13.785
7	11 29 56.92	1.8938	8 6 22.4	13.647	7	12 58 15.15	1.8104	2 59 45.9	13.767
8	11 31 50.45	1.8906	7 52 42.9	13.671	8	13 0 3.77	1.8102	3 13 31.4	13.748
9	11 33 43.79	1.8873	7 39 1.9	13.694	9	13 1 52.38	1.8102	3 27 15.7	13.729
10	11 35 36.93	1.8842	7 25 19.6	13.716	10	13 3 40.99	1.8101	3 40 58.9	13.709
11	11 37 29.89	1.8812	7 11 36.0	13.738	11	13 5 29.59	1.8101	3 54 40.8	13.688
12	11 39 22.67	1.8782	6 57 51.1	13.758	12	13 7 18.20	1.8102	4 8 21.4	13.666
13	11 41 15.27	1.8752	6 44 5.0	13.778	13	13 9 6.82	1.8103	4 22 0.7	13.643
14	11 43 7.69	1.8723	6 30 17.8	13.796	14	13 10 55.44	1.8105	4 35 38.6	13.620
15	11 44 59.94	1.8695	6 16 29.5	13.813	15	13 12 44.08	1.8108	4 49 15.1	13.597
16	11 46 52.03	1.8668	6 2 40.2	13.829	16	13 14 32.74	1.8112	5 2 50.2	13.572
17	11 48 43.95	1.8640	5 48 50.0	13.844	17	13 16 21.42	1.8115	5 16 23.7	13.546
18	11 50 35.71	1.8614	5 34 58.9	13.859	18	13 18 10.12	1.8119	5 29 55.7	13.519
19	11 52 27.32	1.8589	5 21 6.9	13.873	19	13 19 58.85	1.8124	5 43 26.0	13.492
20	11 54 18.78	1.8564	5 7 14.1	13.886	20	13 21 47.61	1.8130	5 56 54.7	13.463
21	11 56 10.09	1.8540	4 53 20.6	13.897	21	13 23 36.41	1.8137	6 10 21.6	13.434
22	11 58 1.26	1.8517	4 39 26.5	13.908	22	13 25 25.25	1.8143	6 23 46.8	13.405
23	11 59 52.29	1.8493	N. 4 25 31.7	13.918	23	13 27 14.13	1.8150	S. 6 37 10.2	13.375
SUNDAY 2.					TUESDAY 4.				
0	12 1 43.18	1.8471	N. 4 11 36.4	13.926	0	13 29 3.05	1.8158	S. 6 50 31.8	13.344
1	12 3 33.94	1.8450	3 57 40.6	13.934	1	13 30 52.02	1.8167	7 3 51.5	13.312
2	12 5 24.58	1.8429	3 43 44.3	13.942	2	13 32 41.05	1.8176	7 17 9.2	13.278
3	12 7 15.09	1.8408	3 29 47.6	13.948	3	13 34 30.13	1.8185	7 30 24.9	13.245
4	12 9 5.48	1.8389	3 15 50.6	13.953	4	13 36 19.27	1.8196	7 43 38.6	13.211
5	12 10 55.76	1.8370	3 1 53.3	13.957	5	13 38 8.48	1.8207	7 56 50.2	13.176
6	12 12 45.92	1.8352	2 47 55.8	13.960	6	13 39 57.75	1.8218	8 9 59.7	13.140
7	12 14 35.98	1.8334	2 33 58.1	13.963	7	13 41 47.09	1.8230	8 23 7.0	13.103
8	12 16 25.93	1.8318	2 20 0.2	13.965	8	13 43 36.51	1.8243	8 36 12.1	13.066
9	12 18 15.79	1.8302	2 6 2.3	13.965	9	13 45 26.00	1.8255	8 49 14.9	13.028
10	12 20 5.55	1.8285	1 52 4.4	13.966	10	13 47 15.57	1.8269	9 2 15.4	12.989
11	12 21 55.21	1.8270	1 38 6.4	13.965	11	13 49 5.23	1.8283	9 15 13.6	12.949
12	12 23 44.79	1.8257	1 24 8.6	13.963	12	13 50 54.97	1.8298	9 28 9.3	12.908
13	12 25 34.29	1.8243	1 10 10.9	13.960	13	13 52 44.80	1.8313	9 41 2.6	12.867
14	12 27 23.70	1.8229	0 56 13.4	13.956	14	13 54 34.73	1.8329	9 53 53.4	12.825
15	12 29 13.04	1.8217	0 42 16.2	13.952	15	13 56 24.75	1.8345	10 6 41.6	12.783
16	12 31 2.30	1.8205	0 28 19.2	13.947	16	13 58 14.87	1.8362	10 19 27.3	12.739
17	12 32 51.50	1.8194	0 14 22.6	13.940	17	14 0 5.09	1.8379	10 32 10.3	12.695
18	12 34 40.63	1.8183	N. 0 0 26.4	13.933	18	14 1 55.42	1.8398	10 44 50.7	12.650
19	12 36 29.70	1.8173	S. 0 13 29.4	13.926	19	14 3 45.86	1.8416	10 57 28.3	12.604
20	12 38 18.71	1.8164	0 27 24.7	13.918	20	14 5 36.41	1.8435	11 10 3.2	12.558
21	12 40 7.67	1.8156	0 41 19.5	13.908	21	14 7 27.08	1.8455	11 22 35.2	12.510
22	12 41 56.58	1.8148	0 55 13.6	13.897	22	14 9 17.87	1.8474	11 35 4.4	12.462
23	12 43 45.44	1.8140	1 9 7.1	13.886	23	14 11 8.77	1.8494	11 47 30.7	12.413
24	12 45 34.26	1.8133	S. 1 22 59.9	13.873	24	14 12 59.80	1.8516	S. 11 59 54.0	12.363

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 5.					FRIDAY 7.				
0	14 12 59.80	1.8516	S. 11 59 54.0	12.363	0	15 45 8.55	2.0021	S. 20 41 37.7	9.079
1	14 14 50.96	1.8538	12 12 14.3	12.313	1	15 47 8.79	2.0060	20 50 39.8	8.992
2	14 16 42.25	1.8559	12 24 31.6	12.262	2	15 49 9.27	2.0100	20 59 36.7	8.904
3	14 18 33.67	1.8582	12 36 45.8	12.210	3	15 51 9.99	2.0139	21 8 28.3	8.815
4	14 20 25.23	1.8605	12 48 56.8	12.158	4	15 53 10.94	2.0178	21 17 14.5	8.725
5	14 22 16.93	1.8628	13 1 4.7	12.104	5	15 55 12.13	2.0218	21 25 55.3	8.634
6	14 24 8.77	1.8652	13 13 9.3	12.050	6	15 57 13.55	2.0258	21 34 30.6	8.543
7	14 26 0.75	1.8677	13 25 10.7	11.995	7	15 59 15.22	2.0298	21 43 0.5	8.452
8	14 27 52.89	1.8703	13 37 8.7	11.939	8	16 1 17.12	2.0338	21 51 24.8	8.358
9	14 29 45.18	1.8728	13 49 3.4	11.883	9	16 3 19.27	2.0378	21 59 43.5	8.265
10	14 31 37.62	1.8753	14 0 54.6	11.825	10	16 5 21.66	2.0418	22 7 56.6	8.171
11	14 33 30.22	1.8779	14 12 42.4	11.767	11	16 7 24.29	2.0458	22 16 4.0	8.075
12	14 35 22.97	1.8806	14 24 26.7	11.708	12	16 9 27.16	2.0498	22 24 5.6	7.979
13	14 37 15.89	1.8833	14 36 7.4	11.648	13	16 11 30.27	2.0539	22 32 1.5	7.883
14	14 39 8.97	1.8861	14 47 44.5	11.588	14	16 13 33.63	2.0580	22 39 51.5	7.785
15	14 41 2.22	1.8889	14 59 18.0	11.528	15	16 15 37.23	2.0620	22 47 35.7	7.687
16	14 42 55.64	1.8918	15 10 47.8	11.466	16	16 17 41.07	2.0661	22 55 14.0	7.588
17	14 44 49.23	1.8947	15 22 13.9	11.403	17	16 19 45.16	2.0702	23 2 46.3	7.488
18	14 46 43.00	1.8977	15 33 36.2	11.339	18	16 21 49.49	2.0742	23 10 12.6	7.388
19	14 48 36.95	1.9007	15 44 54.6	11.275	19	16 23 54.06	2.0783	23 17 32.9	7.288
20	14 50 31.08	1.9037	15 56 9.2	11.211	20	16 25 58.88	2.0823	23 24 47.1	7.185
21	14 52 25.39	1.9067	16 7 19.9	11.145	21	16 28 3.94	2.0863	23 31 55.1	7.083
22	14 54 19.88	1.9098	16 18 26.6	11.078	22	16 30 9.24	2.0903	23 38 57.0	6.979
23	14 56 14.56	1.9129	S. 16 29 29.3	11.011	23	16 32 14.78	2.0943	S. 23 45 52.6	6.874
THURSDAY 6.					SATURDAY 8.				
0	14 58 9.43	1.9161	S. 16 40 27.9	10.943	0	16 34 20.56	2.0984	S. 23 52 41.9	6.769
1	15 0 4.49	1.9193	16 51 22.4	10.874	1	16 36 26.59	2.1024	23 59 24.9	6.664
2	15 1 59.75	1.9226	17 2 12.8	10.805	2	16 38 32.85	2.1064	24 6 1.6	6.558
3	15 3 55.20	1.9258	17 12 59.0	10.734	3	16 40 39.36	2.1105	24 12 31.9	6.451
4	15 5 50.85	1.9292	17 23 40.9	10.663	4	16 42 46.11	2.1145	24 18 55.7	6.343
5	15 7 46.70	1.9326	17 34 18.6	10.592	5	16 44 53.10	2.1184	24 25 13.0	6.233
6	15 9 42.76	1.9360	17 44 51.9	10.519	6	16 47 0.32	2.1223	24 31 23.7	6.124
7	15 11 39.02	1.9393	17 55 20.9	10.446	7	16 49 7.78	2.1263	24 37 27.9	6.014
8	15 13 35.48	1.9428	18 5 45.4	10.372	8	16 51 15.48	2.1303	24 43 25.4	5.903
9	15 15 32.16	1.9464	18 16 5.5	10.297	9	16 53 23.41	2.1342	24 49 16.3	5.792
10	15 17 29.05	1.9499	18 26 21.0	10.221	10	16 55 31.58	2.1381	24 55 0.5	5.680
11	15 19 26.15	1.9534	18 36 32.0	10.144	11	16 57 39.98	2.1419	25 0 37.9	5.567
12	15 21 23.46	1.9570	18 46 38.3	10.067	12	16 59 48.61	2.1458	25 6 8.5	5.453
13	15 23 20.99	1.9607	18 56 40.0	9.989	13	17 1 57.47	2.1496	25 11 32.3	5.339
14	15 25 18.74	1.9643	19 6 37.0	9.910	14	17 4 6.56	2.1534	25 16 49.2	5.224
15	15 27 16.71	1.9680	19 16 29.2	9.830	15	17 6 15.88	2.1572	25 21 59.2	5.108
16	15 29 14.90	1.9717	19 26 16.6	9.750	16	17 8 25.42	2.1609	25 27 2.2	4.992
17	15 31 13.31	1.9753	19 35 59.2	9.669	17	17 10 35.19	2.1647	25 31 58.2	4.874
18	15 33 11.94	1.9791	19 45 36.9	9.587	18	17 12 45.18	2.1683	25 36 47.1	4.757
19	15 35 10.80	1.9829	19 55 9.6	9.504	19	17 14 55.39	2.1720	25 41 29.0	4.638
20	15 37 9.89	1.9868	20 4 37.4	9.421	20	17 17 5.82	2.1756	25 46 3.7	4.519
21	15 39 9.21	1.9906	20 14 0.1	9.337	21	17 19 16.46	2.1792	25 50 31.3	4.400
22	15 41 8.76	1.9944	20 23 17.8	9.252	22	17 21 27.32	2.1828	25 54 51.7	4.279
23	15 43 8.54	1.9983	20 32 30.3	9.166	23	17 23 38.39	2.1863	25 59 4.8	4.158
24	15 45 8.55	2.0021	S. 20 41 37.7	9.079	24	17 25 49.67	2.1898	S. 26 3 10.7	4.037

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 9.					TUESDAY 11.				
0	17 25 49.67	2.1898	S. 26 3 10.7	4.037	0	19 13 59.40	2.2938	S. 26 46 46.8	2.373
1	17 28 1.16	2.1932	26 7 9.2	3.914	1	19 16 17.05	2.2945	26 44 20.2	2.514
2	17 30 12.85	2.1966	26 11 0.4	3.792	2	19 18 34.74	2.2951	26 41 45.1	2.655
3	17 32 24.75	2.2000	26 14 44.2	3.668	3	19 20 52.46	2.2955	26 39 1.6	2.796
4	17 34 36.85	2.2033	26 18 20.5	3.543	4	19 23 10.20	2.2958	26 36 9.6	2.937
5	17 36 49.15	2.2066	26 21 49.4	3.419	5	19 25 27.96	2.2962	26 33 9.1	3.078
6	17 39 1.64	2.2098	26 25 10.8	3.294	6	19 27 45.74	2.2965	26 30 0.2	3.219
7	17 41 14.32	2.2130	26 28 24.7	3.168	7	19 30 3.54	2.2968	26 26 42.8	3.361
8	17 43 27.20	2.2162	26 31 31.0	3.042	8	19 32 21.35	2.2969	26 23 16.9	3.502
9	17 45 40.26	2.2193	26 34 29.7	2.914	9	19 34 39.17	2.2970	26 19 42.6	3.643
10	17 47 53.51	2.2223	26 37 20.7	2.787	10	19 36 56.99	2.2970	26 15 59.8	3.784
11	17 50 6.94	2.2253	26 40 4.1	2.658	11	19 39 14.81	2.2969	26 12 8.5	3.926
12	17 52 20.54	2.2282	26 42 39.7	2.529	12	19 41 32.62	2.2968	26 8 8.7	4.067
13	17 54 34.32	2.2311	26 45 7.6	2.401	13	19 43 50.42	2.2966	26 4 0.5	4.208
14	17 56 48.27	2.2339	26 47 27.8	2.271	14	19 46 8.21	2.2963	25 59 43.8	4.348
15	17 59 2.39	2.2368	26 49 40.1	2.140	15	19 48 25.98	2.2960	25 55 18.7	4.489
16	18 1 16.68	2.2395	26 51 44.6	2.010	16	19 50 43.73	2.2957	25 50 45.1	4.630
17	18 3 31.13	2.2421	26 53 41.3	1.879	17	19 53 1.46	2.2953	25 46 3.1	4.770
18	18 5 45.73	2.2447	26 55 30.1	1.747	18	19 55 19.16	2.2948	25 41 12.7	4.910
19	18 8 0.49	2.2473	26 57 10.9	1.614	19	19 57 36.83	2.2943	25 36 13.9	5.051
20	18 10 15.41	2.2498	26 58 43.8	1.482	20	19 59 54.47	2.2937	25 31 6.6	5.192
21	18 12 30.47	2.2524	27 0 8.7	1.348	21	20 2 12.07	2.2930	25 25 50.9	5.331
22	18 14 45.68	2.2547	27 1 25.6	1.215	22	20 4 29.63	2.2923	25 20 26.9	5.470
23	18 17 1.03	2.2569	S. 27 2 34.5	1.082	23	20 6 47.15	2.2916	S. 25 14 54.5	5.610
MONDAY 10.					WEDNESDAY 12.				
0	18 19 16.51	2.2592	S. 27 3 35.4	0.948	0	20 9 4.62	2.2908	S. 25 9 13.7	5.749
1	18 21 32.13	2.2614	27 4 28.2	0.813	1	20 11 22.04	2.2898	25 3 24.6	5.888
2	18 23 47.88	2.2636	27 5 12.9	0.678	2	20 13 39.40	2.2889	24 57 27.1	6.028
3	18 26 3.76	2.2657	27 5 49.5	0.542	3	20 15 56.71	2.2880	24 51 21.3	6.166
4	18 28 19.76	2.2676	27 6 17.9	0.405	4	20 18 13.96	2.2870	24 45 7.2	6.303
5	18 30 35.87	2.2696	27 6 38.1	0.269	5	20 20 31.15	2.2859	24 38 44.9	6.441
6	18 32 52.11	2.2715	27 6 50.2	-0.133	6	20 22 48.27	2.2848	24 32 14.3	6.578
7	18 35 8.45	2.2733	27 6 54.0	+0.005	7	20 25 5.33	2.2837	24 25 35.5	6.716
8	18 37 24.90	2.2751	27 6 49.6	0.142	8	20 27 22.31	2.2824	24 18 48.4	6.853
9	18 39 41.46	2.2768	27 6 37.0	0.279	9	20 29 39.22	2.2813	24 11 53.1	6.990
10	18 41 58.11	2.2783	27 6 16.1	0.418	10	20 31 56.06	2.2800	24 4 49.6	7.126
11	18 44 14.86	2.2799	27 5 46.9	0.556	11	20 34 12.82	2.2787	23 57 38.0	7.262
12	18 46 31.70	2.2814	27 5 9.4	0.691	12	20 36 29.50	2.2773	23 50 18.2	7.398
13	18 48 48.63	2.2828	27 4 23.6	0.833	13	20 38 46.10	2.2759	23 42 50.3	7.532
14	18 51 5.64	2.2842	27 3 29.5	0.972	14	20 41 2.61	2.2745	23 35 14.4	7.666
15	18 53 22.73	2.2854	27 2 27.0	1.112	15	20 43 19.04	2.2731	23 27 30.4	7.801
16	18 55 39.89	2.2866	27 1 16.1	1.251	16	20 45 35.38	2.2716	23 19 38.3	7.935
17	18 57 57.12	2.2878	26 59 56.9	1.390	17	20 47 51.63	2.2701	23 11 38.2	8.068
18	19 0 14.42	2.2889	26 58 29.3	1.531	18	20 50 7.79	2.2686	23 3 30.2	8.200
19	19 2 31.79	2.2899	26 56 53.2	1.671	19	20 52 23.86	2.2670	22 55 14.2	8.332
20	19 4 49.21	2.2908	26 55 8.8	1.810	20	20 54 39.83	2.2653	22 46 50.3	8.463
21	19 7 6.69	2.2917	26 53 16.0	1.951	21	20 56 55.70	2.2637	22 38 18.6	8.595
22	19 9 24.22	2.2925	26 51 14.7	2.092	22	20 59 11.47	2.2620	22 29 38.9	8.727
23	19 11 41.79	2.2932	26 49 5.0	2.233	23	21 1 27.14	2.2603	22 20 51.4	8.856
24	19 13 59.40	2.2938	S. 26 46 46.8	2.373	24	21 3 42.71	2.2587	S. 22 11 56.2	8.985

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 13.					SATURDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 3 42.71	2.2587	S. 22 11 56.2	8.985	0	22 50 6.19	2.1798	S. 12 45 8.9	14.293
1	21 5 58.18	2.2569	22 2 53.2	9.114	1	22 52 16.94	2.1787	12 30 48.7	14.379
2	21 8 13.54	2.2552	21 53 42.5	9.243	2	22 54 27.63	2.1777	12 16 23.4	14.465
3	21 10 28.80	2.2534	21 44 24.1	9.370	3	22 56 38.26	2.1768	12 1 52.9	14.550
4	21 12 43.95	2.2517	21 34 58.1	9.498	4	22 58 48.84	2.1759	11 47 17.4	14.633
5	21 14 59.00	2.2499	21 25 24.4	9.624	5	23 0 59.37	2.1751	11 32 37.0	14.714
6	21 17 13.94	2.2481	21 15 43.2	9.749	6	23 3 9.85	2.1743	11 17 51.7	14.794
7	21 19 28.77	2.2463	21 5 54.5	9.875	7	23 5 20.28	2.1735	11 3 1.7	14.873
8	21 21 43.49	2.2444	20 55 58.2	10.000	8	23 7 30.67	2.1728	10 48 6.9	14.952
9	21 23 58.10	2.2426	20 45 54.5	10.124	9	23 9 41.02	2.1722	10 33 7.5	15.028
10	21 26 12.60	2.2408	20 35 43.3	10.248	10	23 11 51.33	2.1715	10 18 3.5	15.103
11	21 28 26.99	2.2389	20 25 24.8	10.369	11	23 14 1.60	2.1710	10 2 55.1	15.178
12	21 30 41.27	2.2371	20 14 59.0	10.491	12	23 16 11.85	2.1706	9 47 42.2	15.251
13	21 32 55.44	2.2353	20 4 25.9	10.612	13	23 18 22.07	2.1702	9 32 25.0	15.322
14	21 35 9.50	2.2334	19 53 45.6	10.733	14	23 20 32.27	2.1698	9 17 3.6	15.392
15	21 37 23.45	2.2315	19 42 58.0	10.853	15	23 22 42.44	2.1694	9 1 38.0	15.461
16	21 39 37.28	2.2297	19 32 3.3	10.971	16	23 24 52.60	2.1692	8 46 8.3	15.528
17	21 41 51.01	2.2278	19 21 1.5	11.089	17	23 27 2.74	2.1690	8 30 34.6	15.594
18	21 44 4.62	2.2259	19 9 52.6	11.207	18	23 29 12.88	2.1689	8 14 57.0	15.658
19	21 46 18.12	2.2241	18 58 36.7	11.323	19	23 31 23.01	2.1688	7 59 15.6	15.722
20	21 48 31.51	2.2223	18 47 13.9	11.438	20	23 33 33.14	2.1688	7 43 30.4	15.783
21	21 50 44.80	2.2205	18 35 44.1	11.553	21	23 35 43.27	2.1688	7 27 41.6	15.843
22	21 52 57.97	2.2187	18 24 7.5	11.667	22	23 37 53.40	2.1689	7 11 49.2	15.903
23	21 55 11.04	2.2169	S. 18 12 24.1	11.780	23	23 40 3.54	2.1691	S. 6 55 53.3	15.960
FRIDAY 14.					SUNDAY 16.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 57 24.00	2.2151	S. 18 0 33.9	11.892	0	23 42 13.69	2.1693	S. 6 39 54.0	16.016
1	21 59 36.85	2.2133	17 48 37.0	12.003	1	23 44 23.86	2.1697	6 23 51.4	16.070
2	22 1 49.60	2.2117	17 36 33.5	12.113	2	23 46 34.05	2.1700	6 7 45.6	16.123
3	22 4 2.25	2.2099	17 24 23.4	12.223	3	23 48 44.26	2.1704	5 51 36.7	16.174
4	22 6 14.79	2.2082	17 12 6.7	12.332	4	23 50 54.50	2.1709	5 35 24.7	16.224
5	22 8 27.23	2.2064	16 59 43.5	12.440	5	23 53 4.77	2.1715	5 19 9.8	16.273
6	22 10 39.56	2.2048	16 47 13.9	12.547	6	23 55 15.08	2.1722	5 2 52.0	16.319
7	22 12 51.80	2.2032	16 34 37.9	12.653	7	23 57 25.43	2.1729	4 46 31.5	16.364
8	22 15 3.94	2.2015	16 21 55.6	12.758	8	23 59 35.83	2.1737	4 30 8.3	16.408
9	22 17 15.98	2.1998	16 9 7.0	12.862	9	0 1 46.27	2.1744	4 13 42.5	16.450
10	22 19 27.92	2.1983	15 56 12.2	12.964	10	0 3 56.76	2.1753	3 57 14.3	16.490
11	22 21 39.77	2.1969	15 43 11.3	13.066	11	0 6 7.31	2.1763	3 40 43.7	16.529
12	22 23 51.53	2.1953	15 30 4.3	13.167	12	0 8 17.92	2.1774	3 24 10.8	16.566
13	22 26 3.20	2.1938	15 16 51.3	13.267	13	0 10 28.60	2.1785	3 7 35.8	16.602
14	22 28 14.78	2.1923	15 3 32.3	13.366	14	0 12 39.34	2.1797	2 50 58.6	16.636
15	22 30 26.27	2.1908	14 50 7.4	13.463	15	0 14 50.16	2.1809	2 34 19.5	16.668
16	22 32 37.68	2.1895	14 36 36.7	13.560	16	0 17 1.05	2.1823	2 17 38.5	16.698
17	22 34 49.01	2.1882	14 23 0.2	13.656	17	0 19 12.03	2.1837	2 0 55.7	16.727
18	22 37 0.26	2.1868	14 9 18.0	13.750	18	0 21 23.09	2.1851	1 44 11.3	16.754
19	22 39 11.43	2.1855	13 55 30.2	13.843	19	0 23 34.24	2.1867	1 27 25.2	16.780
20	22 41 22.52	2.1843	13 41 36.8	13.936	20	0 25 45.49	2.1883	1 10 37.7	16.803
21	22 43 33.54	2.1831	13 27 37.9	14.027	21	0 27 56.84	2.1901	0 53 48.8	16.825
22	22 45 44.49	2.1819	13 13 33.6	14.117	22	0 30 8.30	2.1918	0 36 58.7	16.845
23	22 47 55.37	2.1808	12 59 23.9	14.206	23	0 32 19.86	2.1936	0 20 7.4	16.864
24	22 50 6.19	2.1798	S. 12 45 8.9	14.293	24	0 34 31.53	2.1955	S. 0 3 15.0	16.881

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 17.					WEDNESDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	34 31.53	2.1955	S. 0 3 15.0	16.881	0	2 23 28.47	2.3692	N. 13 9 39.5	15.380
1	36 43.32	2.1975	N. 0 13 38.3	16.895	1	2 25 50.77	2.3742	13 24 59.9	15.299
2	38 55.23	2.1996	0 30 32.4	16.908	2	2 28 13.37	2.3793	13 40 15.4	15.215
3	41 7.27	2.2018	0 47 27.2	16.919	3	2 30 36.28	2.3843	13 55 25.7	15.128
4	43 19.44	2.2039	1 4 22.7	16.928	4	2 32 59.49	2.3894	14 10 30.8	15.040
5	45 31.74	2.2062	1 21 18.6	16.936	5	2 35 23.01	2.3946	14 25 30.5	14.949
6	47 44.18	2.2086	1 38 15.0	16.942	6	2 37 46.84	2.3998	14 40 24.7	14.857
7	49 56.77	2.2110	1 55 11.6	16.945	7	2 40 10.99	2.4051	14 55 13.3	14.763
8	52 9.50	2.2135	2 12 8.4	16.947	8	2 42 35.45	2.4103	15 9 56.2	14.666
9	54 22.39	2.2161	2 29 5.2	16.947	9	2 45 0.23	2.4157	15 24 33.2	14.568
10	56 35.43	2.2188	2 46 2.0	16.945	10	2 47 25.33	2.4209	15 39 4.3	14.467
11	58 48.64	2.2215	3 2 58.6	16.942	11	2 49 50.74	2.4262	15 53 29.2	14.363
12	1 1 2.01	2.2243	3 19 55.0	16.937	12	2 52 16.47	2.4315	16 7 47.9	14.258
13	1 3 15.55	2.2272	3 36 51.0	16.928	13	2 54 42.52	2.4368	16 22 0.2	14.152
14	1 5 29.27	2.2301	3 53 46.4	16.918	14	2 57 8.89	2.4421	16 36 6.1	14.043
15	1 7 43.16	2.2331	4 10 41.2	16.907	15	2 59 35.59	2.4477	16 50 5.4	13.932
16	1 9 57.24	2.2362	4 27 35.2	16.893	16	3 2 2.61	2.4530	17 3 57.9	13.819
17	1 12 11.50	2.2393	4 44 28.4	16.878	17	3 4 29.95	2.4583	17 17 43.6	13.703
18	1 14 25.96	2.2426	5 1 20.6	16.861	18	3 6 57.61	2.4638	17 31 22.3	13.586
19	1 16 40.61	2.2458	5 18 11.7	16.842	19	3 9 25.60	2.4692	17 44 53.9	13.467
20	1 18 55.46	2.2492	5 35 1.6	16.820	20	3 11 53.91	2.4745	17 58 18.3	13.346
21	1 21 10.52	2.2527	5 51 50.1	16.796	21	3 14 22.54	2.4798	18 11 35.4	13.223
22	1 23 25.78	2.2562	6 8 37.1	16.770	22	3 16 51.49	2.4852	18 24 45.1	13.098
23	1 25 41.26	2.2597	N. 6 25 22.5	16.743	23	3 19 20.76	2.4905	N. 18 37 47.2	12.971
TUESDAY 18.					THURSDAY 20.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	1 27 56.95	2.2633	N. 6 42 6.2	16.713	0	3 21 50.35	2.4958	N. 18 50 41.6	12.843
1	1 30 12.86	2.2671	6 58 48.1	16.682	1	3 24 20.26	2.5012	19 3 28.3	12.712
2	1 32 29.00	2.2709	7 15 28.0	16.648	2	3 26 50.49	2.5065	19 16 7.0	12.578
3	1 34 45.37	2.2748	7 32 5.9	16.613	3	3 29 21.04	2.5118	19 28 37.7	12.444
4	1 37 1.97	2.2787	7 48 41.6	16.575	4	3 31 51.90	2.5170	19 41 0.3	12.307
5	1 39 18.81	2.2827	8 5 14.9	16.535	5	3 34 23.08	2.5222	19 53 14.6	12.169
6	1 41 35.89	2.2867	8 21 45.8	16.493	6	3 36 54.56	2.5273	20 5 20.6	12.030
7	1 43 53.21	2.2908	8 38 14.1	16.449	7	3 39 26.36	2.5325	20 17 18.2	11.888
8	1 46 10.78	2.2949	8 54 39.7	16.403	8	3 41 58.46	2.5376	20 29 7.2	11.744
9	1 48 28.60	2.2992	9 11 2.5	16.355	9	3 44 30.87	2.5427	20 40 47.5	11.598
10	1 50 46.68	2.3035	9 27 22.3	16.305	10	3 47 3.58	2.5477	20 52 19.0	11.452
11	1 53 5.02	2.3078	9 43 39.1	16.253	11	3 49 36.59	2.5526	21 3 41.7	11.303
12	1 55 23.62	2.3123	9 59 52.6	16.198	12	3 52 9.89	2.5575	21 14 55.4	11.153
13	1 57 42.49	2.3167	10 16 2.8	16.142	13	3 54 43.49	2.5624	21 26 0.0	11.000
14	2 0 1.62	2.3212	10 32 9.6	16.083	14	3 57 17.38	2.5672	21 36 55.4	10.847
15	2 2 21.03	2.3258	10 48 12.8	16.023	15	3 59 51.55	2.5718	21 47 41.6	10.692
16	2 4 40.71	2.3303	11 4 12.3	15.960	16	4 2 26.00	2.5765	21 58 18.4	10.534
17	2 7 0.67	2.3350	11 20 8.0	15.895	17	4 5 0.73	2.5812	22 8 45.7	10.376
18	2 9 20.91	2.3398	11 35 59.7	15.828	18	4 7 35.74	2.5858	22 19 3.5	10.216
19	2 11 41.44	2.3446	11 51 47.3	15.758	19	4 10 11.02	2.5902	22 29 11.6	10.054
20	2 14 2.26	2.3494	12 7 30.7	15.687	20	4 12 46.56	2.5945	22 39 10.0	9.892
21	2 16 23.37	2.3543	12 23 9.7	15.613	21	4 15 22.36	2.5988	22 48 58.6	9.727
22	2 18 44.77	2.3592	12 38 44.3	15.538	22	4 17 58.41	2.6029	22 58 37.2	9.561
23	2 21 6.47	2.3642	12 54 14.3	15.460	23	4 20 34.71	2.6071	23 8 5.9	9.394
24	2 23 28.47	2.3692	N. 13 9 39.5	15.380	24	4 23 11.26	2.6112	N. 23 17 24.5	9.226

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 21.					SUNDAY 23.				
0	4 23 11.26	2.6112	N.23 17 24.5	9.226	0	6 30 47.66	2.6494	N.27 9 33.8	0.305
1	4 25 48.05	2.6151	23 26 33.0	9.056	1	6 33 26.54	2.6465	27 9 46.5	+0.118
2	4 28 25.07	2.6189	23 35 31.2	8.884	2	6 36 5.24	2.6434	27 9 48.0	-0.068
3	4 31 2.32	2.6227	23 44 19.1	8.712	3	6 38 43.75	2.6401	27 9 38.3	0.253
4	4 33 39.79	2.6263	23 52 56.6	8.538	4	6 41 22.05	2.6367	27 9 17.6	0.438
5	4 36 17.47	2.6298	24 1 23.7	8.364	5	6 44 0.15	2.6332	27 8 45.8	0.622
6	4 38 55.36	2.6332	24 9 40.3	8.188	6	6 46 38.03	2.6295	27 8 3.0	0.804
7	4 41 33.45	2.6364	24 17 46.3	8.011	7	6 49 15.69	2.6257	27 7 9.3	0.987
8	4 44 11.73	2.6396	24 25 41.6	7.833	8	6 51 53.11	2.6217	27 6 4.6	1.168
9	4 46 50.20	2.6427	24 33 26.2	7.654	9	6 54 30.29	2.6176	27 4 49.1	1.348
10	4 49 28.85	2.6457	24 41 0.1	7.474	10	6 57 7.22	2.6133	27 3 22.8	1.528
11	4 52 7.68	2.6485	24 48 23.1	7.293	11	6 59 43.89	2.6090	27 1 45.7	1.708
12	4 54 46.67	2.6512	24 55 35.3	7.112	12	7 2 20.30	2.6045	26 59 57.9	1.885
13	4 57 25.82	2.6538	25 2 36.5	6.928	13	7 4 56.43	2.5998	26 57 59.5	2.062
14	5 0 5.12	2.6562	25 9 26.7	6.745	14	7 7 32.28	2.5950	26 55 50.5	2.238
15	5 2 44.56	2.6585	25 16 5.9	6.561	15	7 10 7.83	2.5901	26 53 31.0	2.413
16	5 5 24.14	2.6607	25 22 34.0	6.376	16	7 12 43.09	2.5851	26 51 1.0	2.586
17	5 8 3.84	2.6627	25 28 51.0	6.190	17	7 15 18.04	2.5799	26 48 20.7	2.758
18	5 10 43.60	2.6646	25 34 56.8	6.003	18	7 17 52.68	2.5747	26 45 30.0	2.930
19	5 13 23.59	2.6663	25 40 51.4	5.816	19	7 20 27.00	2.5693	26 42 29.1	3.100
20	5 16 3.62	2.6679	25 46 34.7	5.628	20	7 23 1.00	2.5639	26 39 18.0	3.269
21	5 18 43.74	2.6693	25 52 6.8	5.440	21	7 25 34.67	2.5583	26 35 56.8	3.438
22	5 21 23.94	2.6707	25 57 27.5	5.251	22	7 28 8.00	2.5527	26 32 25.5	3.604
23	5 24 4.22	2.6718	N.26 2 36.9	5.063	23	7 30 40.99	2.5468	N.26 28 44.3	3.769
SATURDAY 22.					MONDAY 24.				
0	5 26 44.56	2.6728	N.26 7 35.0	4.873	0	7 33 13.62	2.5409	N.26 24 53.2	3.933
1	5 29 24.96	2.6737	26 12 21.7	4.683	1	7 35 45.90	2.5350	26 20 52.3	4.097
2	5 32 5.40	2.6743	26 16 56.9	4.492	2	7 38 17.82	2.5289	26 16 41.6	4.258
3	5 34 45.88	2.6749	26 21 20.7	4.302	3	7 40 49.37	2.5227	26 12 21.3	4.418
4	5 37 26.39	2.6753	26 25 33.1	4.111	4	7 43 20.54	2.5164	26 7 51.4	4.578
5	5 40 6.92	2.6755	26 29 34.0	3.919	5	7 45 51.34	2.5102	26 3 12.0	4.735
6	5 42 47.45	2.6756	26 33 23.4	3.728	6	7 48 21.76	2.5038	25 58 23.2	4.892
7	5 45 27.99	2.6755	26 37 1.3	3.537	7	7 50 51.79	2.4973	25 53 25.0	5.048
8	5 48 8.51	2.6752	26 40 27.8	3.346	8	7 53 21.43	2.4908	25 48 17.5	5.201
9	5 50 49.02	2.6748	26 43 42.8	3.154	9	7 55 50.68	2.4842	25 43 0.9	5.353
10	5 53 29.49	2.6743	26 46 46.3	2.963	10	7 58 19.53	2.4774	25 37 35.2	5.503
11	5 56 9.93	2.6736	26 49 38.3	2.771	11	8 0 47.97	2.4706	25 32 0.5	5.653
12	5 58 50.32	2.6727	26 52 18.8	2.579	12	8 3 16.00	2.4638	25 26 16.8	5.802
13	6 1 30.65	2.6716	26 54 47.8	2.388	13	8 5 43.62	2.4569	25 20 24.3	5.948
14	6 4 10.91	2.6703	26 57 5.4	2.198	14	8 8 10.83	2.4500	25 14 23.1	6.093
15	6 6 51.09	2.6690	26 59 11.5	2.007	15	8 10 37.62	2.4430	25 8 13.2	6.237
16	6 9 31.19	2.6675	27 1 6.2	1.816	16	8 13 3.99	2.4360	25 1 54.7	6.378
17	6 12 11.19	2.6658	27 2 49.4	1.625	17	8 15 29.94	2.4289	24 55 27.8	6.519
18	6 14 51.08	2.6638	27 4 21.2	1.435	18	8 17 55.46	2.4218	24 48 52.4	6.659
19	6 17 30.85	2.6618	27 5 41.6	1.246	19	8 20 20.55	2.4147	24 42 8.7	6.797
20	6 20 10.50	2.6597	27 6 50.7	1.057	20	8 22 45.22	2.4075	24 35 16.8	6.933
21	6 22 50.02	2.6574	27 7 48.4	0.868	21	8 25 9.45	2.4002	24 28 16.8	7.068
22	6 25 29.39	2.6549	27 8 34.8	0.679	22	8 27 33.24	2.3929	24 21 8.7	7.201
23	6 28 8.61	2.6522	27 9 9.9	0.492	23	8 29 56.60	2.3857	24 13 52.7	7.333
24	6 30 47.66	2.6494	N.27 9 33.8	0.305	24	8 32 19.52	2.3783	N.24 6 28.8	7.463

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 25.					THURSDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 32 19.52	2.3783	N.24 6 28.8	7.463	0	10 18 12.04	2.0451	N.16 6 4.2	12.014
1	8 34 42.00	2.3711	23 58 57.1	7.592	1	10 20 14.57	2.0393	15 54 1.5	12.076
2	8 37 4.05	2.3638	23 51 17.8	7.718	2	10 22 16.75	2.0334	15 41 55.1	12.137
3	8 39 25.65	2.3563	23 43 30.9	7.845	3	10 24 18.58	2.0277	15 29 45.1	12.197
4	8 41 46.81	2.3490	23 35 36.4	7.970	4	10 26 20.07	2.0220	15 17 31.5	12.255
5	8 44 7.53	2.3416	23 27 34.5	8.098	5	10 28 21.22	2.0163	15 5 14.5	12.313
6	8 46 27.80	2.3342	23 19 25.3	8.213	6	10 30 22.03	2.0108	14 52 54.0	12.369
7	8 48 47.63	2.3268	23 11 8.9	8.333	7	10 32 22.52	2.0054	14 40 30.2	12.423
8	8 51 7.02	2.3194	23 2 45.3	8.452	8	10 34 22.68	2.0000	14 28 3.2	12.477
9	8 53 25.96	2.3120	22 54 14.7	8.568	9	10 36 22.52	1.9946	14 15 33.0	12.529
10	8 55 44.46	2.3047	22 45 37.1	8.684	10	10 38 22.03	1.9893	14 2 59.7	12.581
11	8 58 2.52	2.2973	22 36 52.6	8.798	11	10 40 21.23	1.9841	13 50 23.3	12.632
12	9 0 20.13	2.2898	22 28 1.3	8.910	12	10 42 20.12	1.9790	13 37 43.9	12.681
13	9 2 37.30	2.2825	22 19 3.4	9.021	13	10 44 18.71	1.9739	13 25 1.6	12.729
14	9 4 54.03	2.2751	22 9 58.8	9.130	14	10 46 16.99	1.9688	13 12 16.4	12.776
15	9 7 10.31	2.2677	22 0 47.8	9.238	15	10 48 14.97	1.9639	12 59 28.5	12.822
16	9 9 26.15	2.2603	21 51 30.3	9.344	16	10 50 12.66	1.9591	12 46 37.8	12.867
17	9 11 41.55	2.2531	21 42 6.5	9.449	17	10 52 10.06	1.9543	12 33 44.5	12.910
18	9 13 56.22	2.2458	21 32 36.4	9.553	18	10 54 7.17	1.9495	12 20 48.6	12.953
19	9 16 11.05	2.2386	21 23 0.1	9.656	19	10 56 4.00	1.9449	12 7 50.1	12.995
20	9 18 25.15	2.2313	21 13 17.7	9.756	20	10 58 0.56	1.9403	11 54 49.2	13.036
21	9 20 38.81	2.2241	21 3 29.4	9.854	21	10 59 56.84	1.9358	11 41 45.8	13.076
22	9 22 52.04	2.2168	20 53 35.2	9.952	22	11 1 52.85	1.9313	11 28 40.1	13.114
23	9 25 4.83	2.2097	N.20 43 35.1	10.049	23	11 3 48.60	1.9270	N.11 15 32.1	13.152
WEDNESDAY 26.					FRIDAY 28.				
0	9 27 17.20	2.2026	N.20 33 29.3	10.144	0	11 5 44.09	1.9228	N.11 2 21.8	13.189
1	9 29 29.14	2.1955	20 23 17.8	10.238	1	11 7 39.33	1.9185	10 49 9.4	13.224
2	9 31 40.66	2.1885	20 13 0.8	10.329	2	11 9 34.31	1.9143	10 35 54.9	13.258
3	9 33 51.76	2.1815	20 2 38.3	10.420	3	11 11 29.04	1.9102	10 22 38.4	13.292
4	9 36 2.44	2.1745	19 52 10.4	10.509	4	11 13 23.53	1.9062	10 9 19.9	13.324
5	9 38 12.70	2.1675	19 41 37.2	10.597	5	11 15 17.78	1.9023	9 55 59.5	13.356
6	9 40 22.54	2.1606	19 30 58.8	10.683	6	11 17 11.80	1.8984	9 42 37.2	13.387
7	9 42 31.97	2.1538	19 20 15.2	10.768	7	11 19 5.59	1.8946	9 29 13.1	13.417
8	9 44 40.99	2.1470	19 9 26.6	10.852	8	11 20 59.15	1.8908	9 15 47.2	13.446
9	9 46 49.61	2.1403	18 58 33.0	10.934	9	11 22 52.49	1.8872	9 2 19.6	13.473
10	9 48 57.82	2.1335	18 47 34.5	11.016	10	11 24 45.62	1.8837	8 48 50.4	13.500
11	9 51 5.63	2.1268	18 36 31.1	11.096	11	11 26 38.53	1.8801	8 35 19.6	13.526
12	9 53 13.04	2.1202	18 25 23.0	11.174	12	11 28 31.23	1.8767	8 21 47.3	13.551
13	9 55 20.05	2.1137	18 14 10.2	11.251	13	11 30 23.73	1.8733	8 8 13.5	13.575
14	9 57 26.68	2.1072	18 2 52.9	11.326	14	11 32 16.03	1.8701	7 54 38.3	13.597
15	9 59 32.91	2.1007	17 51 31.1	11.401	15	11 34 8.14	1.8668	7 41 1.8	13.619
16	10 1 38.76	2.0943	17 40 4.8	11.474	16	11 36 0.05	1.8637	7 27 24.0	13.641
17	10 3 44.22	2.0879	17 28 34.2	11.546	17	11 37 51.78	1.8607	7 13 44.9	13.662
18	10 5 49.31	2.0817	17 16 59.3	11.617	18	11 39 43.33	1.8577	7 0 4.6	13.681
19	10 7 54.02	2.0753	17 5 20.2	11.687	19	11 41 34.70	1.8548	6 46 23.2	13.699
20	10 9 58.35	2.0692	16 53 36.9	11.755	20	11 43 25.90	1.8519	6 32 40.7	13.717
21	10 12 2.32	2.0631	16 41 49.6	11.821	21	11 45 16.93	1.8491	6 18 57.1	13.734
22	10 14 5.92	2.0570	16 29 58.4	11.887	22	11 47 7.79	1.8463	6 5 12.6	13.750
23	10 16 9.16	2.0510	16 18 3.2	11.952	23	11 48 58.49	1.8437	5 51 27.1	13.765
24	10 18 12.04	2.0451	N.16 6 4.2	12.014	24	11 50 49.04	1.8413	N. 5 37 40.8	13.778



GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 29.					MONDAY 31.				
	<div>h m s</div>	<div>s</div>	<div>° ' "</div>	<div>"</div>		<div>h m s</div>	<div>s</div>	<div>° ' "</div>	<div>"</div>
0	11 50 49.04	1.8413	N. 5 37 40.8	13.778	0	13 17 33.63	1.7988	S. 5 24 18.3	13.498
1	11 52 39.44	1.8388	5 23 53.7	13.792	1	13 19 21.58	1.7993	5 37 47.4	13.473
2	11 54 29.69	1.8363	5 10 5.8	13.805	2	13 21 9.57	1.8003	5 51 15.0	13.447
3	11 56 19.79	1.8339	4 56 17.1	13.817	3	13 22 57.61	1.8012	6 4 41.0	13.420
4	11 58 9.76	1.8317	4 42 27.8	13.827	4	13 24 45.71	1.8021	6 18 5.4	13.393
5	11 59 59.59	1.8294	4 28 37.9	13.837	5	13 26 33.86	1.8030	6 31 28.1	13.364
6	12 1 49.29	1.8273	4 14 47.4	13.846	6	13 28 22.07	1.8040	6 44 49.1	13.336
7	12 3 38.87	1.8253	4 0 56.4	13.853	7	13 30 10.34	1.8050	6 58 8.4	13.306
8	12 5 28.32	1.8233	3 47 5.0	13.861	8	13 31 58.67	1.8062	7 11 25.3	13.275
9	12 7 17.66	1.8213	3 33 13.1	13.868	9	13 33 47.08	1.8074	7 24 41.4	13.244
10	12 9 6.88	1.8194	3 19 20.8	13.874	10	13 35 35.56	1.8086	7 37 55.1	13.212
11	12 10 55.99	1.8177	3 5 28.2	13.878	11	13 37 24.11	1.8098	7 51 6.9	13.179
12	12 12 45.00	1.8160	2 51 35.4	13.883	12	13 39 12.74	1.8112	8 4 16.6	13.145
13	12 14 33.91	1.8143	2 37 42.3	13.886	13	13 41 1.46	1.8127	8 17 24.3	13.112
14	12 16 22.72	1.8128	2 23 49.1	13.888	14	13 42 50.26	1.8141	8 30 30.0	13.077
15	12 18 11.44	1.8113	2 9 55.8	13.889	15	13 44 39.15	1.8157	8 43 33.5	13.040
16	12 20 0.07	1.8098	1 56 2.4	13.891	16	13 46 28.14	1.8172	8 56 34.8	13.003
17	12 21 48.61	1.8083	1 42 8.9	13.891	17	13 48 17.22	1.8188	9 9 33.9	12.967
18	12 23 37.07	1.8071	1 28 15.5	13.889	18	13 50 6.40	1.8206	9 22 30.8	12.928
19	12 25 25.46	1.8059	1 14 22.2	13.888	19	13 51 55.69	1.8223	9 35 25.3	12.889
20	12 27 13.78	1.8048	1 0 29.0	13.885	20	13 53 45.08	1.8241	9 48 17.5	12.849
21	12 29 2.03	1.8036	0 46 36.0	13.882	21	13 55 34.58	1.8259	10 1 7.2	12.808
22	12 30 50.21	1.8025	0 32 43.2	13.878	22	13 57 24.19	1.8278	10 13 54.5	12.767
23	12 32 38.33	1.8016	N. 0 18 50.6	13.873	23	13 59 13.92	1.8298	S. 10 26 39.3	12.725
SUNDAY 30.					TUESDAY, NOVEMBER 1.				
0	12 34 26.40	1.8008	N. 0 4 58.4	13.868	0	14 1 3.76	1.8318	S. 10 39 21.5	12.682
1	12 36 14.42	1.7999	S. 0 8 53.5	13.861	PHASES OF THE MOON.				
2	12 38 2.39	1.7991	0 22 44.9	13.853					
3	12 39 50.31	1.7984	0 36 35.9	13.846					
4	12 41 38.20	1.7978	0 50 26.4	13.837					
5	12 43 26.05	1.7973	1 4 16.3	13.828	● New Moon . . . . . Oct. 2 20 32.0 ☾ First Quarter . . . . . 11 1 40.0 ○ Full Moon . . . . . 18 2 24.4 ☾ Last Quarter . . . . . 24 17 47.9				
6	12 45 13.87	1.7968	1 18 5.7	13.818					
7	12 47 1.66	1.7963	1 31 54.4	13.806					
8	12 48 49.43	1.7960	1 45 42.4	13.794					
9	12 50 37.18	1.7957	1 59 29.7	13.782	☾ Apogee . . . . . Oct. 6 19.2 ☾ Perigee . . . . . 19 3.2				
10	12 52 24.91	1.7954	2 13 16.2	13.768					
11	12 54 12.63	1.7953	2 27 1.8	13.753					
12	12 56 0.34	1.7952	2 40 46.6	13.738					
13	12 57 48.05	1.7951	2 54 30.4	13.723					
14	12 59 35.75	1.7951	3 8 13.3	13.706					
15	13 1 23.46	1.7953	3 21 55.1	13.688					
16	13 3 11.18	1.7954	3 35 35.9	13.671					
17	13 4 58.91	1.7956	3 49 15.6	13.652					
18	13 6 46.65	1.7958	4 2 54.1	13.632					
19	13 8 34.41	1.7962	4 16 31.4	13.612					
20	13 10 22.20	1.7967	4 30 7.5	13.591					
21	13 12 10.01	1.7971	4 43 42.3	13.568					
22	13 13 57.85	1.7976	4 57 15.7	13.545					
23	13 15 45.72	1.7982	5 10 47.7	13.522					
24	13 17 33.63	1.7988	S. 5 24 18.3	13.498					

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
5	SUN	W.	23 45 36	3452	25 6 54	3454	26 28 10	3455	27 49 24	3456
	α Aquilæ	E.	85 22 19	3868	84 8 27	3877	82 54 44	3887	81 41 11	3898
	Fomalhaut	E.	116 2 20	3248	114 37 8	3248	113 11 56	3248	111 46 44	3247
6	SUN	W.	34 35 9	3465	35 56 12	3467	37 17 13	3468	38 38 13	3470
	α Aquilæ	E.	75 36 26	3964	74 24 11	3980	73 12 12	3998	72 0 30	4016
	Fomalhaut	E.	104 40 45	3850	103 15 35	3850	101 50 25	3851	100 25 16	3852
	α Pegasi	E.	122 56 15	3624	121 38 7	3611	120 19 44	3598	119 1 7	3586
7	SUN	W.	45 22 55	3472	46 43 50	3471	48 4 46	3471	49 25 42	3470
	α Aquilæ	E.	66 6 48	4185	64 57 10	4151	63 47 56	4178	62 39 9	4207
	Fomalhaut	E.	93 19 39	3253	91 54 33	3253	90 29 26	3253	89 4 19	3252
	α Pegasi	E.	112 24 52	3533	111 5 4	3585	109 45 7	3517	108 25 1	3509
8	SUN	W.	56 10 47	3460	57 31 56	3456	58 53 9	3453	60 14 26	3449
	α Aquilæ	E.	57 2 52	4391	55 57 22	4435	54 52 32	4483	53 48 25	4535
	Fomalhaut	E.	81 58 35	3249	80 33 24	3247	79 8 11	3246	77 42 56	3245
	α Pegasi	E.	101 42 27	3473	100 21 33	3467	99 0 32	3461	97 39 24	3454
9	SUN	W.	67 2 9	3421	68 24 2	3415	69 46 2	3408	71 8 10	3400
	Antares	W.	13 53 27	3124	15 21 8	3105	16 49 12	3087	18 17 38	3071
	α Aquilæ	E.	48 40 28	4870	47 41 49	4956	46 44 19	5049	45 48 2	5132
	Fomalhaut	E.	70 36 13	3235	69 10 46	3233	67 45 16	3231	66 19 43	3229
	α Pegasi	E.	90 52 1	3424	89 30 12	3418	88 8 17	3412	86 46 14	3406
10	SUN	W.	78 1 15	3354	79 24 24	3343	80 47 46	3332	82 11 21	3320
	Antares	W.	25 44 13	3005	27 14 19	2993	28 44 41	2980	30 15 19	2967
	Fomalhaut	E.	59 11 21	3218	57 45 33	3217	56 19 44	3216	54 53 53	3215
	α Pegasi	E.	79 54 24	3379	78 31 43	3373	77 8 56	3368	75 46 3	3363
	SATURN	E.	119 49 1	2953	118 17 49	2943	116 46 25	2933	115 14 48	2923
	α Arietis	E.	122 15 10	3091	120 46 50	3078	119 18 14	3065	117 49 22	3052
11	SUN	W.	89 12 45	3256	90 37 48	3242	92 3 8	3226	93 28 46	3211
	Antares	W.	37 52 28	2902	39 24 44	2888	40 57 18	2873	42 30 11	2859
	Fomalhaut	E.	47 44 42	3222	46 18 59	3226	44 53 21	3232	43 27 50	3241
	α Pegasi	E.	68 50 19	3343	67 26 57	3340	66 3 32	3338	64 40 4	3336
	SATURN	E.	107 33 11	2863	106 0 5	2850	104 26 43	2837	102 53 3	2823
	α Arietis	E.	110 20 48	2981	108 50 12	2966	107 19 17	2951	105 48 3	2935
12	SUN	W.	100 41 35	3130	102 9 8	3113	103 37 2	3095	105 5 18	3077
	Antares	W.	50 19 24	2782	51 54 16	2765	53 29 29	2748	55 5 5	2731
	Fomalhaut	E.	36 23 37	3323	34 59 53	3352	33 36 42	3388	32 14 12	3432
	α Pegasi	E.	57 42 41	3344	56 19 19	3350	54 56 5	3357	53 32 59	3366
	SATURN	E.	95 0 2	2748	93 24 26	2732	91 48 29	2716	90 12 10	2699
	α Arietis	E.	98 6 57	2856	96 33 42	2840	95 0 6	2823	93 26 8	2806
13	SUN	W.	112 32 17	2982	114 2 52	2963	115 33 51	2943	117 5 15	2924
	Antares	W.	63 8 48	2643	64 46 45	2625	66 25 6	2606	68 3 53	2588
	α Pegasi	E.	46 41 8	3458	45 19 54	3485	43 59 14	3521	42 39 13	3563
	SATURN	E.	82 4 55	2612	80 26 17	2594	78 47 14	2576	77 7 47	2558
	α Arietis	E.	85 30 42	2719	83 54 28	2701	82 17 50	2684	80 40 49	2666
	Aldebaran	E.	115 50 11	2678	114 13 2	2658	112 35 26	2639	110 57 24	2620

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
5	SUN W.	29 10 37	3458	30 31 48	3460	31 52 57	3462	33 14 4	3463
	α Aquilæ E.	80 27 49	3910	79 14 39	3922	78 1 41	3935	76 48 56	3949
	Fomalhaut E.	110 21 31	3248	108 56 19	3248	107 31 8	3248	106 5 56	3249
6	SUN W.	39 59 11	3471	41 20 8	3471	42 41 4	3471	44 2 0	3472
	α Aquilæ E.	70 49 6	4035	69 38 1	4055	68 27 15	4076	67 16 50	4100
	Fomalhaut E.	99 0 8	3252	97 35 0	3253	96 9 53	3253	94 44 46	3253
	α Pegasi E.	117 42 17	3574	116 23 14	3562	115 3 58	3551	113 44 30	3542
7	SUN W.	50 46 39	3469	52 7 38	3467	53 28 38	3465	54 49 41	3463
	α Aquilæ E.	61 30 50	4239	60 23 1	4273	59 15 43	4310	58 8 59	4350
	Fomalhaut E.	87 39 11	3252	86 14 3	3251	84 48 55	3250	83 23 45	3250
	α Pegasi E.	107 4 47	3501	105 44 24	3494	104 23 53	3487	103 3 14	3480
8	SUN W.	61 35 47	3444	62 57 13	3439	64 18 45	3433	65 40 24	3427
	α Aquilæ E.	52 45 4	4592	51 42 32	4653	50 40 53	4720	49 40 11	4792
	Fomalhaut E.	76 17 40	3243	74 52 22	3241	73 27 1	3239	72 1 38	3237
	α Pegasi E.	96 18 9	3448	94 56 47	3442	93 35 19	3436	92 13 43	3430
9	SUN W.	72 30 27	3391	73 52 54	3382	75 15 30	3373	76 38 17	3364
	Antares W.	19 46 23	3056	21 15 27	3043	22 44 47	3030	24 14 22	3018
	α Aquilæ E.	44 53 4	5265	43 59 30	5389	43 7 27	5526	42 17 1	5679
	Fomalhaut E.	64 54 8	3226	63 28 30	3224	62 2 49	3222	60 37 6	3220
	α Pegasi E.	85 24 5	3400	84 1 49	3395	82 39 27	3390	81 16 59	3384
10	SUN W.	83 35 9	3308	84 59 11	3296	86 23 27	3283	87 47 58	3270
	Antares W.	31 46 13	2955	33 17 22	2942	34 48 48	2929	36 20 30	2916
	Fomalhaut E.	53 28 2	3214	52 2 10	3215	50 36 19	3216	49 10 29	3219
	α Pegasi E.	74 23 5	3358	73 0 1	3354	71 36 52	3350	70 13 38	3346
	SATURN E.	113 42 58	2912	112 10 54	2900	110 38 35	2888	109 6 1	2876
	α Arietis E.	116 20 14	3038	114 50 49	3024	113 21 6	3010	111 51 6	2996
11	SUN W.	94 54 42	3196	96 20 56	3180	97 47 30	3164	99 14 23	3147
	Antares W.	44 3 22	2844	45 36 53	2829	47 10 43	2814	48 44 53	2798
	Fomalhaut E.	42 2 29	3251	40 37 20	3264	39 12 26	3279	37 47 50	3299
	α Pegasi E.	63 16 35	3335	61 53 4	3336	60 29 35	3338	59 6 7	3340
	SATURN E.	101 19 5	2809	99 44 48	2794	98 10 13	2779	96 35 18	2763
	α Arietis E.	104 16 29	2920	102 44 36	2905	101 12 23	2889	99 39 50	2873
12	SUN W.	106 33 56	3058	108 2 57	3040	109 32 20	3021	111 2 7	3002
	Antares W.	56 41 3	2714	58 17 24	2697	59 54 8	2679	61 31 16	2661
	Fomalhaut E.	30 52 32	3486	29 31 52	3551	28 12 23	3629	26 54 19	3725
	α Pegasi E.	52 10 4	3378	50 47 22	3393	49 24 57	3410	48 2 51	3430
	SATURN E.	88 35 29	2682	86 58 25	2665	85 20 59	2648	83 43 9	2630
	α Arietis E.	91 51 48	2789	90 17 6	2772	88 42 1	2754	87 6 33	2737
13	SUN W.	118 37 4	2904	120 9 18	2883	121 41 58	2863	123 15 4	2842
	Antares W.	69 43 5	2569	71 22 43	2550	73 2 46	2531	74 43 16	2512
	α Pegasi E.	41 19 58	3611	40 1 36	3668	38 44 16	3736	37 28 7	3814
	SATURN E.	75 27 54	2539	73 47 35	2521	72 6 51	2502	70 25 41	2483
	α Arietis E.	79 3 24	2649	77 25 35	2631	75 47 22	2614	74 8 46	2596
	Aldebaran E.	109 18 56	2601	107 40 2	2581	106 0 41	2562	104 20 54	2543

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
14	Antares W.	76 24 12	2498	78 5 35	2474	79 47 24	2455	81 29 40	2436
	α Aquilæ W.	41 53 31	5082	42 49 28	4896	43 47 40	4724	44 48 19	4566
	SATURN E.	68 44 4	2465	67 2 1	2446	65 19 32	2427	63 36 36	2408
	α Arietis E.	72 29 46	2579	70 50 22	2563	69 10 36	2546	67 30 26	2529
	Aldebaran E.	102 40 40	2523	100 59 59	2504	99 18 51	2485	97 37 16	2466
15	Antares W.	90 7 40	2344	91 52 36	2326	93 37 58	2308	95 23 46	2291
	α Aquilæ W.	50 22 55	3952	51 35 22	3856	52 49 26	3768	54 5 2	3684
	SATURN E.	54 55 16	2317	53 9 41	2298	51 23 39	2281	49 37 11	2264
	α Arietis E.	59 4 1	2453	57 21 41	2440	55 39 3	2427	53 56 7	2415
	Aldebaran E.	89 2 41	2373	87 18 27	2355	85 33 47	2337	83 48 41	2320
16	Antares W.	104 19 3	2208	106 7 19	2193	107 55 58	2178	109 44 59	2163
	α Aquilæ W.	60 43 22	3351	62 6 35	3297	63 30 50	3247	64 56 4	3201
	Fomalhaut W.	26 9 36	3217	27 35 25	3086	29 3 52	2973	30 34 39	2876
	SATURN E.	40 38 37	2182	38 49 42	2167	37 0 25	2152	35 10 45	2137
	α Arietis E.	45 17 40	2373	43 33 26	2370	41 49 8	2368	40 4 47	2368
	Aldebaran E.	74 57 4	2239	73 9 35	2224	71 21 43	2210	69 33 30	2197
	Pollux E.	118 58 49	2206	117 10 30	2190	115 21 47	2175	113 32 42	2161
17	α Aquilæ W.	72 14 46	3017	73 44 38	2988	75 15 6	2962	76 46 7	2939
	Fomalhaut W.	38 35 0	2548	40 15 7	2503	41 56 16	2463	43 38 21	2428
	SATURN E.	25 57 20	2077	24 5 45	2067	22 13 55	2052	20 21 50	2049
	Aldebaran E.	60 27 42	2139	58 37 43	2130	56 47 29	2122	54 57 2	2114
	Pollux E.	104 22 1	2096	102 30 56	2085	100 39 33	2074	98 47 54	2064
18	α Aquilæ W.	84 27 33	2858	86 0 46	2848	87 34 12	2841	89 7 47	2835
	Fomalhaut W.	52 19 54	2296	54 5 59	2279	55 52 29	2263	57 39 23	2248
	α Pegasi W.	37 5 15	3256	38 30 18	3152	39 57 25	3060	41 26 24	2979
	Aldebaran E.	45 42 28	2092	43 51 17	2092	42 0 5	2092	40 8 54	2094
	Pollux E.	89 26 11	2025	87 33 16	2020	85 40 13	2015	83 47 2	2011
	Regulus E.	125 44 45	2044	123 52 20	2038	121 59 45	2032	120 7 1	2028
19	α Aquilæ W.	96 56 20	2845	98 29 49	2854	100 3 7	2866	101 36 10	2880
	Fomalhaut W.	66 38 26	2201	68 26 52	2197	70 15 24	2193	72 4 2	2190
	α Pegasi W.	49 12 53	2703	50 49 28	2667	52 26 52	2635	54 4 59	2607
	Aldebaran E.	30 54 53	2139	29 4 54	2157	27 15 22	2180	25 26 24	2209
	Pollux E.	74 19 55	2001	72 26 23	2002	70 32 52	2003	68 39 23	2005
	Regulus E.	110 41 54	2015	108 48 44	2015	106 55 34	2016	105 2 25	2018
20	Fomalhaut W.	81 7 26	2198	82 55 57	2203	84 44 21	2208	86 32 37	2215
	α Pegasi W.	62 23 32	2519	64 4 19	2509	65 45 20	2502	67 26 32	2497
	SATURN W.	19 32 3	2009	21 25 23	2014	23 18 36	2020	25 11 40	2026
	Pollux E.	59 13 7	2026	57 20 14	2032	55 27 30	2039	53 34 57	2047
	Regulus E.	95 37 44	2037	93 45 8	2043	91 52 41	2050	90 0 25	2057
21	Fomalhaut W.	95 30 58	2262	97 17 53	2274	99 4 30	2287	100 50 48	2301
	α Pegasi W.	75 53 22	2498	77 34 38	2503	79 15 47	2510	80 56 47	2517
	SATURN W.	34 34 8	2069	36 25 55	2079	38 17 26	2090	40 8 40	2101
	α Arietis W.	32 20 11	2375	34 4 22	2359	35 48 55	2348	37 33 44	2341
	Pollux E.	44 15 28	2094	42 24 20	2105	40 33 29	2117	38 42 55	2129
	Regulus E.	80 42 15	2104	78 51 22	2115	77 0 45	2126	75 10 25	2138

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh
			° ' "		° ' "		° ' "		° ' "
14	Antares	W.	83 12 22	2417	84 55 32	2399	86 39 8	2380	88 23 11
	α Aquilæ	W.	45 51 13	4422	46 56 14	4391	48 3 15	4168	49 12 11
	SATURN	E.	61 53 13	2390	60 9 24	2371	58 25 8	2353	56 40 25
	α Arietis	E.	65 49 53	2513	64 8 58	2497	62 27 40	2482	60 46 1
	Aldebaran	E.	95 55 15	2447	94 12 46	2428	92 29 51	2409	90 46 29
15	Antares	W.	97 9 59	2273	98 56 38	2256	100 43 42	2240	102 31 10
	α Aquilæ	W.	55 22 6	3608	56 40 32	3536	58 0 16	3470	59 21 14
	SATURN	E.	47 50 18	2247	46 2 59	2230	44 15 16	2214	42 27 8
	α Arietis	E.	52 12 53	2404	50 29 24	2394	48 45 41	2386	47 1 46
	Aldebaran	E.	82 3 10	2303	80 17 14	2286	78 30 54	2270	76 44 10
16	Antares	W.	111 34 22	2150	113 24 6	2137	115 14 9	2124	117 4 32
	α Aquilæ	W.	66 22 12	3158	67 49 11	3118	69 16 59	3081	70 45 32
	Fomalhaut	W.	32 7 29	2792	33 42 8	2719	35 18 22	2655	36 56 2
	SATURN	E.	33 20 43	2124	31 30 20	2111	29 39 38	2099	27 48 38
	α Arietis	E.	38 20 27	2372	36 36 13	2380	34 52 9	2391	33 8 21
	Aldebaran	E.	67 44 57	2184	65 56 5	2172	64 6 54	2160	62 17 26
	Pollux	E.	111 43 15	2147	109 53 26	2133	108 3 17	2120	106 12 48
17	α Aquilæ	W.	78 17 36	2918	79 49 32	2898	81 21 53	2882	82 54 34
	Fomalhaut	W.	45 21 16	2396	47 4 57	2367	48 49 19	2341	50 34 19
	SATURN	E.	18 29 32	2042	16 37 4	2037	14 44 28	2035	12 51 48
	Aldebaran	E.	53 6 24	2107	51 15 36	2102	49 24 39	2098	47 33 36
	Pollux	E.	96 56 0	2055	95 3 52	2046	93 11 30	2039	91 18 56
18	α Aquilæ	W.	90 41 29	2833	92 15 14	2833	93 48 59	2835	95 22 42
	Fomalhaut	W.	59 26 39	2236	61 14 13	2225	63 2 4	2215	64 50 9
	α Pegasi	W.	42 57 3	2909	44 29 11	2848	46 2 37	2794	47 37 13
	Aldebaran	E.	38 17 46	2099	36 26 45	2105	34 35 53	2114	32 45 14
	Pollux	E.	81 53 45	2008	80 0 23	2005	78 6 56	2003	76 13 26
	Regulus	E.	118 14 10	2024	116 21 13	2020	114 28 10	2017	112 35 3
19	α Aquilæ	W.	103 8 55	2896	104 41 19	2915	106 13 19	2936	107 44 52
	Fomalhaut	W.	73 52 44	2190	75 41 27	2191	77 30 9	2192	79 18 49
	α Pegasi	W.	55 43 45	2583	57 23 3	2562	59 2 50	2545	60 43 1
	Aldebaran	E.	23 38 10	2245	21 50 50	2291	20 4 38	2352	18 19 54
	Pollux	E.	66 45 57	2008	64 52 35	2012	62 59 19	2016	61 6 9
	Regulus	E.	103 9 19	2021	101 16 17	2024	99 23 20	2027	97 30 28
20	Fomalhaut	W.	88 20 43	2223	90 8 37	2232	91 56 19	2241	93 43 46
	α Pegasi	W.	69 7 50	2493	70 49 13	2492	72 30 37	2492	74 12 1
	SATURN	W.	27 4 34	2033	28 57 17	2041	30 49 48	2050	32 42 5
	Pollux	E.	51 42 36	2055	49 50 28	2064	47 58 33	2073	46 6 53
	Regulus	E.	88 8 20	2065	86 16 28	2074	84 24 49	2084	82 33 24
21	Fomalhaut	W.	102 36 46	2316	104 22 22	2331	106 7 36	2348	107 52 26
	α Pegasi	W.	82 37 37	2526	84 18 14	2536	85 58 38	2547	87 38 46
	SATURN	W.	41 59 37	2113	43 50 16	2125	45 40 36	2138	47 30 37
	α Arietis	W.	39 18 44	2336	41 3 51	2335	42 49 0	2335	44 34 8
	Pollux	E.	36 52 40	2142	35 2 45	2155	33 13 10	2169	31 23 55
	Regulus	E.	73 20 24	2150	71 30 42	2163	69 41 19	2176	67 52 16

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
22	Fomalhaut W.	109 36 51	2383	111 20 51	2402	113 4 23	2422	114 47 27	2442
	α Pegasi W.	89 18 38	2372	90 58 11	2387	92 37 24	2368	94 16 16	2348
	SATURN W.	49 20 19	2164	51 9 41	2178	52 58 41	2192	54 47 20	2206
	α Arietis W.	46 19 13	2341	48 4 12	2346	49 49 4	2353	51 33 46	2361
	Aldebaran W.	16 17 0	2620	17 55 27	2536	19 35 21	2512	21 16 16	2483
	Pollux E.	29 35 2	2198	27 46 31	2213	25 58 23	2229	24 10 38	2246
	Regulus E.	66 3 34	2204	64 15 13	2219	62 27 14	2234	60 39 36	2249
	SUN E.	125 37 29	2497	123 56 12	2513	122 15 17	2528	120 34 43	2543
23	α Pegasi W.	102 24 41	2713	104 1 3	2736	105 36 55	2759	107 12 18	2782
	SATURN W.	63 45 11	2281	65 31 38	2296	67 17 43	2311	69 3 26	2327
	α Arietis W.	60 14 5	2412	61 57 23	2424	63 40 24	2436	65 23 7	2448
	Aldebaran W.	29 47 36	2438	31 30 16	2441	33 12 52	2446	34 55 21	2452
	Regulus E.	51 47 13	2329	50 1 55	2346	48 17 2	2363	46 32 34	2380
	SUN E.	112 17 16	2624	110 38 53	2640	109 0 52	2657	107 23 14	2673
24	SATURN W.	77 46 22	2405	79 29 50	2420	81 12 56	2435	82 55 40	2450
	α Arietis W.	73 52 6	2517	75 32 55	2531	77 13 25	2545	78 53 35	2560
	Aldebaran W.	43 25 3	2499	45 6 17	2511	46 47 15	2523	48 27 56	2535
	Regulus E.	37 56 28	2470	36 14 32	2489	34 33 3	2509	32 52 1	2529
	SUN E.	99 20 39	2757	97 45 15	2774	96 10 13	2791	94 35 33	2807
25	SATURN W.	91 24 1	2525	93 4 39	2540	94 44 57	2554	96 24 55	2569
	α Arietis W.	87 9 26	2632	88 47 37	2647	90 25 28	2661	92 3 0	2676
	Aldebaran W.	56 47 5	2599	58 26 2	2612	60 4 41	2624	61 43 3	2637
	Regulus E.	24 34 14	2644	22 56 19	2672	21 19 2	2704	19 42 27	2740
	SUN E.	86 47 32	2889	85 14 59	2904	83 42 45	2920	82 10 51	2935
26	SATURN W.	104 39 58	2636	106 18 4	2649	107 55 52	2662	109 33 23	2675
	α Arietis W.	100 5 50	2747	101 41 27	2761	103 16 47	2775	104 51 48	2788
	Aldebaran W.	69 50 34	2701	71 27 13	2713	73 3 36	2725	74 39 43	2736
	Pollux W.	25 34 26	2675	27 11 39	2687	28 48 36	2698	30 25 18	2710
	SUN E.	74 36 7	3009	73 6 5	3023	71 36 21	3037	70 6 54	3050
27	Aldebaran W.	82 36 27	2794	84 11 3	2805	85 45 5	2815	87 19 33	2826
	Pollux W.	38 25 2	2766	40 0 15	2776	41 35 14	2787	43 9 59	2797
	SUN E.	62 43 41	3114	61 15 49	3126	59 48 11	3138	58 20 48	3149
28	Aldebaran W.	95 6 54	2876	96 39 44	2885	98 12 22	2894	99 44 49	2903
	Pollux W.	51 0 30	2845	52 33 59	2854	54 7 17	2862	55 40 24	2871
	Regulus W.	15 16 6	3045	16 45 23	3022	18 15 9	3004	19 45 17	2991
	SUN E.	51 7 12	3203	49 41 7	3213	48 15 13	3223	46 49 31	3232
29	Aldebaran W.	107 24 14	2946	108 55 35	2954	110 26 46	2962	111 57 47	2969
	Pollux W.	63 23 19	2911	64 55 24	2918	66 27 20	2925	67 59 7	2932
	Regulus W.	27 18 17	2976	28 49 0	2977	30 19 42	2979	31 50 21	2981
	SUN E.	39 43 43	3276	38 19 4	3284	36 54 34	3292	35 30 14	3300
30	Pollux W.	75 35 55	2964	77 6 53	2969	78 37 44	2975	80 8 28	2981
	Regulus W.	39 22 47	2997	40 53 3	3001	42 23 14	3005	43 53 21	3009
	SUN E.	28 30 43	3336	27 7 13	3343	25 43 51	3350	24 20 37	3356

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
		° ' "		° ' "		° ' "		° ' "	
22	Fomalhaut W.	116 30 2	2464	118 12 6	2486	119 53 39	2509	121 34 40	2533
	α Pegasi W.	95 54 46	2635	97 32 53	2654	99 10 35	2673	100 47 51	2692
	SATURN W.	56 35 38	2221	58 23 34	2236	60 11 9	2251	61 58 21	2266
	α Arietis W.	53 18 17	2370	55 2 35	2379	56 46 40	2389	58 30 30	2400
	Aldebaran W.	22 57 53	2463	24 39 58	2450	26 22 22	2443	28 4 56	2438
	Pollux E.	22 23 19	2264	20 36 26	2283	18 50 0	2302	17 4 3	2322
	Regulus E.	58 52 21	2264	57 5 29	2280	55 19 0	2296	53 32 55	2312
	SUN E.	118 54 30	2359	117 14 39	2374	115 35 9	2391	113 56 2	2607
23	α Pegasi W.	108 47 10	2806	110 21 30	2832	111 55 16	2859	113 28 28	2887
	SATURN W.	70 48 46	2342	72 33 44	2358	74 18 19	2373	76 2 32	2389
	α Arietis W.	67 5 33	2461	68 47 40	2475	70 29 28	2489	72 10 57	2503
	Aldebaran W.	36 37 42	2460	38 19 52	2469	40 1 49	2478	41 43 33	2488
	Regulus E.	44 48 30	2397	43 4 51	2415	41 21 38	2433	39 38 50	2451
	SUN E.	105 45 58	2690	104 9 5	2707	102 32 34	2723	100 56 25	2740
24	SATURN W.	84 38 3	2466	86 20 4	2481	88 1 44	2496	89 43 3	2511
	α Arietis W.	80 33 25	2574	82 12 55	2589	83 52 5	2604	85 30 55	2618
	Aldebaran W.	50 8 21	2548	51 48 28	2560	53 28 18	2573	55 7 50	2586
	Regulus E.	31 11 28	2550	29 31 24	2571	27 51 49	2593	26 12 45	2618
	SUN E.	93 1 14	2824	91 27 17	2840	89 53 41	2856	88 20 26	2873
25	SATURN W.	98 4 33	2583	99 43 52	2596	101 22 52	2610	103 1 34	2623
	α Arietis W.	93 40 12	2690	95 17 5	2704	96 53 39	2719	98 29 54	2733
	Aldebaran W.	63 21 8	2650	64 58 55	2663	66 36 25	2675	68 13 38	2688
	Regulus E.	18 6 40	2782	16 31 49	2834	14 58 5	2899	13 25 43	2982
	SUN E.	80 39 16	2950	79 8 1	2965	77 37 4	2980	76 6 26	2995
26	SATURN W.	111 10 37	2687	112 47 34	2699	114 24 16	2710	116 0 42	2722
	α Arietis W.	106 26 31	2802	108 0 55	2816	109 35 2	2830	111 8 51	2843
	Aldebaran W.	76 15 35	2748	77 51 11	2760	79 26 31	2771	81 1 36	2782
	Pollux W.	32 1 45	2721	33 37 56	2732	35 13 53	2744	36 49 35	2755
	SUN E.	68 37 43	3064	67 8 49	3077	65 40 11	3089	64 11 48	3102
27	Aldebaran W.	88 53 27	2836	90 27 8	2846	92 0 36	2856	93 33 51	2866
	Pollux W.	44 44 31	2807	46 18 49	2817	47 52 55	2826	49 26 49	2836
	SUN E.	56 53 38	3161	55 26 42	3172	53 59 59	3183	52 33 29	3193
28	Aldebaran W.	101 17 4	2912	102 49 8	2921	104 21 0	2929	105 52 42	2937
	Pollux W.	57 13 20	2879	58 46 5	2887	60 18 40	2895	61 51 4	2903
	Regulus W.	21 15 40	2984	22 46 13	2979	24 16 52	2977	25 47 34	2976
	SUN E.	45 24 0	3242	43 58 40	3251	42 33 31	3259	41 8 32	3268
29	Aldebaran W.	113 28 38	2977	114 59 19	2985	116 29 51	2992	118 0 14	3000
	Pollux W.	69 30 45	2939	71 2 15	2946	72 33 36	2952	74 4 49	2958
	Regulus W.	33 20 58	2984	34 51 31	2987	36 22 0	2990	37 52 26	2993
	SUN E.	34 6 3	3308	32 42 1	3315	31 18 7	3322	29 54 21	3329
30	Pollux W.	81 39 4	2986	83 9 34	2992	84 39 57	2997	86 10 14	3001
	Regulus W.	45 23 23	3012	46 53 21	3016	48 23 14	3020	49 53 2	3025
	SUN E.	22 57 30	3362	21 34 31	3368	20 11 38	3374	18 48 52	3380

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.					
		Apparent Right Ascension.		Diff. for 1 Hour.	Apparent Declination.		Diff. for 1 Hour.				Semi-diameter.				
		h	m	s	s	°	'				"	"	'	"	
Tues.	1	14	23	13.80	9.778	S. 14	14	30.4	-48.48	16	9.00	66.83	16	18.05	0.078
Wed.	2	14	27	8.86	9.811	14	33	47.2	47.90	16	9.25	66.94	16	19.54	0.045
Thur.	3	14	31	4.74	9.845	14	52	49.9	47.30	16	9.49	67.06	16	20.23	0.011
Frid.	4	14	35	1.42	9.879	15	11	37.9	-46.68	16	9.74	67.17	16	20.10	0.023
Sat.	5	14	38	58.91	9.913	15	30	10.9	46.05	16	9.99	67.29	16	19.16	0.057
SUN.	6	14	42	57.22	9.947	15	48	28.5	45.40	16	10.24	67.41	16	17.41	0.091
Mon.	7	14	46	56.36	9.981	16	6	30.2	-44.73	16	10.48	67.53	16	14.84	0.125
Tues.	8	14	50	56.32	10.015	16	24	15.8	44.04	16	10.72	67.65	16	11.45	0.159
Wed.	9	14	54	57.10	10.050	16	41	44.8	43.34	16	10.96	67.77	16	7.24	0.193
Thur.	10	14	58	58.71	10.085	16	58	56.6	-42.62	16	11.19	67.89	16	2.20	0.228
Frid.	11	15	3	1.15	10.120	17	15	51.0	41.88	16	11.42	68.01	15	56.32	0.262
Sat.	12	15	7	4.43	10.155	17	32	27.5	41.13	16	11.65	68.13	15	49.62	0.297
SUN.	13	15	11	8.54	10.189	17	48	45.8	-40.36	16	11.88	68.25	15	42.09	0.332
Mon.	14	15	15	13.49	10.224	18	4	45.4	39.58	16	12.11	68.37	15	33.72	0.367
Tues.	15	15	19	19.27	10.259	18	20	26.0	38.78	16	12.33	68.49	15	24.52	0.402
Wed.	16	15	23	25.89	10.294	18	35	47.3	-37.97	16	12.54	68.61	15	14.48	0.436
Thur.	17	15	27	33.36	10.329	18	50	48.8	37.15	16	12.75	68.72	15	3.60	0.471
Frid.	18	15	31	41.67	10.364	19	5	30.3	36.31	16	12.96	68.84	14	51.88	0.506
Sat.	19	15	35	50.82	10.399	19	19	51.3	-35.45	16	13.16	68.95	14	39.32	0.541
SUN.	20	15	40	0.81	10.434	19	33	51.4	34.57	16	13.35	69.07	14	25.93	0.576
Mon.	21	15	44	11.64	10.469	19	47	30.4	33.68	16	13.54	69.18	14	11.70	0.611
Tues.	22	15	48	23.29	10.503	20	0	48.0	-32.77	16	13.73	69.29	13	56.65	0.645
Wed.	23	15	52	35.76	10.537	20	13	43.7	31.85	16	13.91	69.40	13	40.78	0.679
Thur.	24	15	56	49.04	10.571	20	26	17.1	30.91	16	14.09	69.51	13	24.10	0.712
Frid.	25	16	1	3.12	10.604	20	38	27.8	-29.96	16	14.26	69.61	13	6.61	0.744
Sat.	26	16	5	17.99	10.636	20	50	15.6	29.00	16	14.43	69.71	12	48.34	0.776
SUN.	27	16	9	33.62	10.667	21	1	40.1	28.02	16	14.59	69.81	12	29.32	0.807
Mon.	28	16	13	50.00	10.697	21	12	41.0	-27.03	16	14.76	69.91	12	9.56	0.838
Tues.	29	16	18	7.11	10.727	21	23	17.9	26.02	16	14.92	70.01	11	49.07	0.868
Wed.	30	16	22	24.92	10.757	21	33	30.5	25.00	16	15.08	70.10	11	27.87	0.897
Thur.	31	16	26	43.42	10.785	S. 21	43	18.6	-23.97	16	15.23	70.19	11	6.00	0.925

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0<sup>s</sup>.19 from the sideral time.  
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.



## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ' "	"	m s	s	h m s
Tues.	1	14 23 16.44	9.778	S. 14 14 43.5	-48.48	16 18.08	0.078	14 39 34.53
Wed.	2	14 27 11.52	9.811	14 34 0.2	47.90	16 19.56	0.045	14 43 31.08
Thur.	3	14 31 7.41	9.845	14 53 2.7	47.30	16 20.23	0.011	14 47 27.64
Frid.	4	14 35 4.10	9.879	15 11 50.6	-46.68	16 20.09	0.023	14 51 24.19
Sat.	5	14 39 1.60	9.913	15 30 23.4	46.04	16 19.14	0.057	14 55 20.75
SUN.	6	14 42 59.92	9.947	15 48 40.8	45.39	16 17.38	0.091	14 59 17.30
Mon.	7	14 46 59.05	9.981	16 6 42.3	-44.72	16 14.80	0.125	15 3 13.86
Tues.	8	14 50 59.00	10.015	16 24 27.7	44.04	16 11.40	0.159	15 7 10.41
Wed.	9	14 54 59.78	10.050	16 41 56.4	43.33	16 7.18	0.193	15 11 6.97
Thur.	10	14 59 1.39	10.084	16 59 8.0	-42.61	16 2.13	0.228	15 15 3.53
Frid.	11	15 3 3.83	10.119	17 16 2.1	41.87	15 56.25	0.262	15 19 0.08
Sat.	12	15 7 7.10	10.153	17 32 38.3	41.12	15 49.55	0.297	15 22 56.64
SUN.	13	15 11 11.20	10.188	17 48 56.3	-40.35	15 42.01	0.332	15 26 53.20
Mon.	14	15 15 16.13	10.223	18 4 55.6	39.57	15 33.63	0.367	15 30 49.76
Tues.	15	15 19 21.90	10.258	18 20 35.9	38.77	15 24.42	0.402	15 34 46.31
Wed.	16	15 23 28.50	10.292	18 35 56.9	-37.96	15 14.37	0.436	15 38 42.87
Thur.	17	15 27 35.94	10.327	18 50 58.3	37.13	15 3.48	0.471	15 42 39.43
Frid.	18	15 31 44.22	10.362	19 5 39.4	36.28	14 51.76	0.506	15 46 35.98
Sat.	19	15 35 53.35	10.397	19 20 0.0	-35.42	14 39.19	0.541	15 50 32.54
SUN.	20	15 40 3.31	10.431	19 33 59.7	34.54	14 25.78	0.576	15 54 29.09
Mon.	21	15 44 14.10	10.466	19 47 38.3	33.65	14 11.55	0.611	15 58 25.65
Tues.	22	15 48 25.72	10.500	20 0 55.5	-32.75	13 56.49	0.645	16 2 22.21
Wed.	23	15 52 38.15	10.535	20 13 50.9	31.83	13 40.62	0.679	16 6 18.77
Thur.	24	15 56 51.39	10.568	20 26 23.9	30.90	13 23.94	0.712	16 10 15.33
Frid.	25	16 1 5.43	10.601	20 38 34.3	-29.95	13 6.46	0.744	16 14 11.88
Sat.	26	16 5 20.25	10.633	20 50 21.8	28.99	12 48.20	0.776	16 18 8.44
SUN.	27	16 9 35.83	10.665	21 1 46.0	28.01	12 29.17	0.807	16 22 5.00
Mon.	28	16 13 52.15	10.695	21 12 46.5	-27.02	12 9.40	0.838	16 26 1.55
Tues.	29	16 18 9.20	10.725	21 23 23.0	26.01	11 48.91	0.868	16 29 58.11
Wed.	30	16 22 26.96	10.753	21 33 35.3	24.99	11 27.71	0.897	16 33 54.67
Thur.	31	16 26 45.40	10.782	S. 21 43 23.0	-23.96	11 5.83	0.925	16 37 51.23

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour,  
+ 9.8565,  
(Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	305	218 11 52.7	11 25.1	150.20	+ 0.38	9.996 6270	- 46.7	h m s 9 18 53.66
2	306	219 11 58.5	11 30.8	150.28	0.25	9.996 5152	46.5	9 14 57.75
3	307	220 12 6.2	11 38.3	150.36	+ 0.12	9.996 4038	46.3	9 11 1.84
4	308	221 12 15.6	11 47.6	150.43	- 0.01	9.996 2929	- 46.1	9 7 5.93
5	309	222 12 26.8	11 58.6	150.50	0.13	9.996 1827	45.8	9 3 10.02
6	310	223 12 39.6	12 11.3	150.57	0.24	9.996 0731	45.5	8 59 14.11
7	311	224 12 53.9	12 25.5	150.63	- 0.32	9.995 9643	- 45.2	8 55 18.20
8	312	225 13 9.8	12 41.2	150.69	0.38	9.995 8564	44.8	8 51 22.29
9	313	226 13 27.2	12 58.4	150.75	0.42	9.995 7495	44.3	8 47 26.38
10	314	227 13 46.0	13 17.1	150.81	- 0.43	9.995 6437	- 43.8	8 43 30.47
11	315	228 14 6.3	13 37.2	150.87	0.40	9.995 5392	43.2	8 39 34.56
12	316	229 14 27.9	13 58.7	150.93	0.35	9.995 4362	42.6	8 35 38.65
13	317	230 14 51.0	14 21.6	150.99	- 0.25	9.995 3348	- 41.9	8 31 42.74
14	318	231 15 15.4	14 45.9	151.05	0.14	9.995 2352	41.1	8 27 46.83
15	319	232 15 41.3	15 11.6	151.11	- 0.02	9.995 1376	40.2	8 23 50.92
16	320	233 16 8.6	15 38.7	151.17	+ 0.12	9.995 0421	- 39.3	8 19 55.01
17	321	234 16 37.4	16 7.4	151.24	0.25	9.994 9488	38.4	8 15 59.10
18	322	235 17 7.9	16 37.7	151.30	0.38	9.994 8576	37.5	8 12 3.19
19	323	236 17 40.0	17 9.6	151.37	+ 0.50	9.994 7686	- 36.6	8 8 7.28
20	324	237 18 13.7	17 43.2	151.44	0.60	9.994 6817	35.8	8 4 11.37
21	325	238 18 49.2	18 18.6	151.51	0.67	9.994 5969	35.0	8 0 15.45
22	326	239 19 26.5	18 55.7	151.59	+ 0.70	9.994 5140	- 34.2	7 56 19.54
23	327	240 20 5.4	19 34.4	151.66	0.70	9.994 4329	33.4	7 52 23.63
24	328	241 20 46.0	20 14.8	151.73	0.68	9.994 3535	32.7	7 48 27.72
25	329	242 21 28.3	20 56.9	151.80	+ 0.63	9.994 2757	- 32.1	7 44 31.80
26	330	243 22 12.2	21 40.6	151.86	0.55	9.994 1995	31.5	7 40 35.89
27	331	244 22 57.6	22 25.9	151.92	0.45	9.994 1247	30.9	7 36 39.98
28	332	245 23 44.5	23 12.6	151.98	+ 0.33	9.994 0513	- 30.3	7 32 44.07
29	333	246 24 32.8	24 0.7	152.04	0.20	9.993 9792	29.7	7 28 48.16
30	334	247 25 22.4	24 50.2	152.09	+ 0.07	9.993 9085	29.2	7 24 52.25
31	335	248 26 13.3	25 40.9	152.14	- 0.07	9.993 8391	- 28.7	7 20 56.33
NOTE.—The numbers in column $\lambda$ correspond to the true equinox of the date; in column $\lambda'$ to the mean equinox of January 0 <sup>h</sup> .								
Diff. for 1 Hour, — 9 <sup>s</sup> .8296. (Table II.)								

GREENWICH MEAN TIME.									
Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	"	"	"	"	"	"	h m	m	d
1	14 47.1	14 45.7	54 9.9	- 0.48	54 4.8	- 0.38	6	.	29.1
2	14 44.6	14 43.9	54 0.8	0.28	53 58.1	- 0.17	0 2.3	1.79	0.4
3	14 43.5	14 43.5	53 56.7	- 0.06	53 56.7	+ 0.06	0 46.1	1.87	1.4
4	14 43.9	14 44.7	53 58.2	+ 0.19	54 1.2	+ 0.32	1 32.3	1.98	2.4
5	14 46.0	14 47.8	54 5.9	0.46	54 12.4	0.61	2 21.0	2.08	3.4
6	14 50.1	14 52.9	54 20.7	0.78	54 31.0	0.95	3 11.7	2.15	4.4
7	14 56.2	15 0.2	54 43.3	+ 1.12	54 57.8	+ 1.30	4 3.6	2.17	5.4
8	15 4.7	15 9.8	55 14.5	1.48	55 33.3	1.66	4 55.6	2.15	6.4
9	15 15.5	15 21.8	55 54.2	1.83	56 17.1	1.99	5 46.8	2.11	7.4
10	15 28.6	15 35.8	56 41.9	+ 2.13	57 8.4	+ 2.26	6 36.7	2.05	8.4
11	15 43.3	15 51.1	57 36.1	2.35	58 4.8	2.41	7 25.4	2.01	9.4
12	15 59.1	16 6.9	58 33.9	2.42	59 2.9	2.38	8 13.6	2.01	10.4
13	16 14.6	16 21.9	59 31.1	+ 2.29	59 57.9	+ 2.13	9 2.2	2.05	11.4
14	16 28.6	16 34.5	60 22.4	1.92	60 44.0	1.65	9 52.4	2.14	12.4
15	16 39.4	16 43.1	61 2.0	1.32	61 15.6	0.94	10 45.6	2.29	13.4
16	16 45.5	16 46.6	61 24.5	+ 0.53	61 28.3	+ 0.10	11 42.7	2.47	14.4
17	16 46.2	16 44.4	61 26.8	- 0.34	61 20.2	- 0.76	12 44.2	2.64	15.4
18	16 41.2	16 36.9	61 8.7	1.15	60 52.7	1.49	13 48.8	2.72	16.4
19	16 31.4	16 25.2	60 32.8	- 1.80	60 9.7	- 2.03	14 53.9	2.68	17.4
20	16 18.2	16 10.7	59 44.1	2.21	59 16.8	2.32	15 56.4	2.52	18.4
21	16 3.0	15 55.2	58 48.4	2.38	58 19.7	2.39	16 54.2	2.29	19.4
22	15 47.4	15 39.8	57 51.1	- 2.35	57 23.3	- 2.27	17 46.5	2.08	20.4
23	15 32.6	15 25.7	56 56.7	2.16	56 31.4	2.03	18 34.0	1.89	21.4
24	15 19.3	15 13.4	56 7.9	1.88	55 46.3	1.72	19 17.8	1.77	22.4
25	15 8.1	15 3.3	55 26.7	- 1.55	55 9.2	- 1.38	19 59.2	1.69	23.4
26	14 59.0	14 55.4	54 53.7	1.21	54 40.2	1.04	20 39.5	1.67	24.4
27	14 52.3	14 49.6	54 28.7	0.88	54 19.1	0.72	21 19.7	1.69	25.4
28	14 47.5	14 45.9	54 11.4	- 0.58	54 5.3	- 0.44	22 0.9	1.75	26.4
29	14 44.7	14 43.9	54 0.9	0.31	53 58.0	- 0.18	22 43.9	1.84	27.4
30	14 43.5	14 43.4	53 56.5	- 0.07	53 56.4	+ 0.05	23 29.4	1.95	28.4
31	14 43.8	14 44.4	53 57.6	+ 0.15	54 0.0	+ 0.25	6	.	29.4
32	14 45.4	14 46.8	54 3.7	+ 0.36	54 8.6	+ 0.46	0 17.4	2.05	0.6

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 1.					THURSDAY 3.				
0	14 1 3.76	1.8316	S. 10 39 21.5	12.682	0	15 32 10.39	1.9789	S. 19 43 29.3	9.678
1	14 2 53.73	1.8339	10 52 1.1	12.638	1	15 34 9.24	1.9828	19 53 7.5	9.596
2	14 4 43.83	1.8360	11 4 38.1	12.594	2	15 36 8.33	1.9867	20 2 40.8	9.513
3	14 6 34.05	1.8381	11 17 12.4	12.549	3	15 38 7.64	1.9905	20 12 9.0	9.428
4	14 8 24.40	1.8403	11 29 44.0	12.503	4	15 40 7.19	1.9944	20 21 32.2	9.343
5	14 10 14.89	1.8427	11 42 12.8	12.456	5	15 42 6.97	1.9983	20 30 50.2	9.258
6	14 12 5.52	1.8450	11 54 38.7	12.408	6	15 44 6.99	2.0023	20 40 3.1	9.171
7	14 13 56.29	1.8473	12 7 1.7	12.359	7	15 46 7.24	2.0061	20 49 10.7	9.083
8	14 15 47.20	1.8497	12 19 21.8	12.310	8	15 48 7.72	2.0100	20 58 13.1	8.995
9	14 17 38.25	1.8522	12 31 38.9	12.260	9	15 50 8.44	2.0140	21 7 10.1	8.905
10	14 19 29.46	1.8548	12 43 53.0	12.210	10	15 52 9.40	2.0180	21 16 1.7	8.815
11	14 21 20.82	1.8573	12 56 4.1	12.158	11	15 54 10.60	2.0220	21 24 47.9	8.725
12	14 23 12.33	1.8598	13 8 12.0	12.106	12	15 56 12.04	2.0260	21 33 28.7	8.634
13	14 25 4.00	1.8625	13 20 16.8	12.053	13	15 58 13.72	2.0299	21 42 4.0	8.541
14	14 26 55.83	1.8652	13 32 18.3	11.998	14	16 0 15.63	2.0338	21 50 33.6	8.448
15	14 28 47.82	1.8679	13 44 16.6	11.943	15	16 2 17.78	2.0378	21 58 57.7	8.354
16	14 30 39.98	1.8708	13 56 11.5	11.888	16	16 4 20.17	2.0418	22 7 16.1	8.259
17	14 32 32.31	1.8735	14 8 3.1	11.832	17	16 6 22.80	2.0458	22 15 28.8	8.164
18	14 34 24.80	1.8763	14 19 51.3	11.774	18	16 8 25.67	2.0498	22 23 35.8	8.068
19	14 36 17.47	1.8793	14 31 36.0	11.716	19	16 10 28.77	2.0538	22 31 36.9	7.970
20	14 38 10.32	1.8823	14 43 17.2	11.658	20	16 12 32.12	2.0578	22 39 32.2	7.872
21	14 40 3.35	1.8853	14 54 54.9	11.598	21	16 14 35.70	2.0617	22 47 21.6	7.772
22	14 41 56.56	1.8883	15 6 29.0	11.538	22	16 16 39.52	2.0657	22 55 5.0	7.673
23	14 43 49.95	1.8913	S. 15 17 59.4	11.476	23	16 18 43.58	2.0696	S. 23 2 42.4	7.573
WEDNESDAY 2.					FRIDAY 4.				
0	14 45 43.52	1.8944	S. 15 29 26.1	11.414	0	16 20 47.87	2.0735	S. 23 10 13.8	7.473
1	14 47 37.28	1.8976	15 40 49.1	11.351	1	16 22 52.40	2.0775	23 17 39.1	7.371
2	14 49 31.23	1.9008	15 52 8.2	11.287	2	16 24 57.17	2.0814	23 24 58.3	7.268
3	14 51 25.38	1.9039	16 3 23.5	11.223	3	16 27 2.17	2.0853	23 32 11.3	7.165
4	14 53 19.72	1.9072	16 14 34.9	11.158	4	16 29 7.41	2.0893	23 39 18.1	7.061
5	14 55 14.25	1.9106	16 25 42.4	11.092	5	16 31 12.88	2.0932	23 46 18.6	6.956
6	14 57 8.99	1.9140	16 36 45.9	11.025	6	16 33 18.59	2.0970	23 53 12.8	6.851
7	14 59 3.93	1.9173	16 47 45.4	10.957	7	16 35 24.52	2.1008	24 0 0.7	6.745
8	15 0 59.07	1.9208	16 58 40.7	10.888	8	16 37 30.69	2.1047	24 6 42.2	6.638
9	15 2 54.42	1.9242	17 9 31.9	10.818	9	16 39 37.08	2.1084	24 13 17.2	6.530
10	15 4 49.97	1.9276	17 20 18.9	10.748	10	16 41 43.70	2.1122	24 19 45.7	6.420
11	15 6 45.73	1.9311	17 31 1.7	10.677	11	16 43 50.55	2.1161	24 26 7.6	6.311
12	15 8 41.70	1.9346	17 41 40.1	10.604	12	16 45 57.63	2.1198	24 32 23.0	6.202
13	15 10 37.88	1.9382	17 52 14.2	10.532	13	16 48 4.93	2.1235	24 38 31.8	6.091
14	15 12 34.28	1.9418	18 2 44.0	10.459	14	16 50 12.45	2.1272	24 44 33.9	5.979
15	15 14 30.89	1.9453	18 13 9.3	10.384	15	16 52 20.19	2.1308	24 50 29.3	5.868
16	15 16 27.72	1.9491	18 23 30.1	10.309	16	16 54 28.15	2.1345	24 56 18.0	5.755
17	15 18 24.78	1.9527	18 33 46.4	10.233	17	16 56 36.33	2.1381	25 1 59.9	5.641
18	15 20 22.05	1.9563	18 43 58.1	10.157	18	16 58 44.72	2.1418	25 7 34.9	5.527
19	15 22 19.54	1.9601	18 54 5.2	10.079	19	17 0 53.34	2.1453	25 13 3.1	5.413
20	15 24 17.26	1.9638	19 4 7.6	10.000	20	17 3 2.16	2.1488	25 18 24.4	5.297
21	15 26 15.20	1.9676	19 14 5.2	9.921	21	17 5 11.19	2.1522	25 23 38.7	5.180
22	15 28 13.37	1.9714	19 23 58.1	9.841	22	17 7 20.42	2.1556	25 28 46.0	5.063
23	15 30 11.77	1.9752	19 33 46.1	9.760	23	17 9 29.86	2.1591	25 33 46.3	4.946
24	15 32 10.39	1.9789	S. 19 43 29.3	9.678	24	17 11 39.51	2.1625	S. 25 38 39.5	4.828

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 5.					MONDAY 7.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	17 11 39.51	2.1625	S. 25 38 39.5	4.828	0	18 58 19.85	2.2584	S. 27 4 37.2	1.390
1	17 13 49.36	2.1658	25 43 25.6	4.709	1	19 0 35.37	2.2588	27 3 9.7	1.526
2	17 15 59.40	2.1690	25 48 4.6	4.590	2	19 2 50.91	2.2592	27 1 34.1	1.662
3	17 18 9.64	2.1723	25 52 36.4	4.470	3	19 5 6.47	2.2594	26 59 50.3	1.798
4	17 20 20.07	2.1754	25 57 1.0	4.349	4	19 7 22.04	2.2596	26 57 58.3	1.935
5	17 22 30.69	2.1786	26 1 18.3	4.228	5	19 9 37.62	2.2598	26 55 58.1	2.071
6	17 24 41.50	2.1817	26 5 28.4	4.107	6	19 11 53.21	2.2598	26 53 49.8	2.207
7	17 26 52.49	2.1848	26 9 31.1	3.984	7	19 14 8.80	2.2598	26 51 33.3	2.343
8	17 29 3.67	2.1878	26 13 26.5	3.862	8	19 16 24.38	2.2597	26 49 8.6	2.479
9	17 31 15.03	2.1908	26 17 14.5	3.738	9	19 18 39.96	2.2596	26 46 35.8	2.615
10	17 33 26.56	2.1936	26 20 55.1	3.614	10	19 20 55.53	2.2593	26 43 54.8	2.752
11	17 35 38.26	2.1964	26 24 28.2	3.489	11	19 23 11.08	2.2590	26 41 5.6	2.888
12	17 37 50.13	2.1993	26 27 53.8	3.364	12	19 25 26.61	2.2587	26 38 8.3	3.023
13	17 40 2.17	2.2020	26 31 11.9	3.238	13	19 27 42.12	2.2583	26 35 2.8	3.160
14	17 42 14.37	2.2047	26 34 22.4	3.113	14	19 29 57.61	2.2578	26 31 49.1	3.296
15	17 44 26.73	2.2073	26 37 25.4	2.987	15	19 32 13.06	2.2573	26 28 27.3	3.431
16	17 46 39.25	2.2099	26 40 20.8	2.859	16	19 34 28.48	2.2567	26 24 57.4	3.567
17	17 48 51.92	2.2124	26 43 8.5	2.732	17	19 36 43.86	2.2560	26 21 19.3	3.703
18	17 51 4.74	2.2148	26 45 48.6	2.604	18	19 38 59.20	2.2553	26 17 33.1	3.838
19	17 53 17.70	2.2173	26 48 21.0	2.476	19	19 41 14.50	2.2546	26 13 38.8	3.973
20	17 55 30.81	2.2197	26 50 45.7	2.347	20	19 43 29.75	2.2538	26 9 36.4	4.108
21	17 57 44.06	2.2219	26 53 2.6	2.217	21	19 45 44.95	2.2530	26 5 25.9	4.243
22	17 59 57.44	2.2241	26 55 11.7	2.088	22	19 48 0.10	2.2520	26 1 7.3	4.377
23	18 2 10.95	2.2263	S. 26 57 13.1	1.958	23	19 50 15.19	2.2509	S. 25 56 40.7	4.511
SUNDAY 6.					TUESDAY 8.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	18 4 24.59	2.2284	S. 26 59 6.6	1.827	0	19 52 30.21	2.2498	S. 25 52 6.0	4.645
1	18 6 38.36	2.2304	27 0 52.3	1.696	1	19 54 45.17	2.2488	25 47 23.3	4.779
2	18 8 52.24	2.2323	27 2 30.1	1.564	2	19 57 0.07	2.2477	25 42 32.5	4.913
3	18 11 6.24	2.2343	27 4 0.0	1.433	3	19 59 14.89	2.2464	25 37 33.8	5.045
4	18 13 20.35	2.2361	27 5 22.1	1.302	4	20 1 29.64	2.2453	25 32 27.1	5.178
5	18 15 34.57	2.2378	27 6 36.2	1.168	5	20 3 44.32	2.2440	25 27 12.4	5.312
6	18 17 48.89	2.2396	27 7 42.3	1.036	6	20 5 58.92	2.2426	25 21 49.7	5.444
7	18 20 3.32	2.2413	27 8 40.5	0.903	7	20 8 13.43	2.2412	25 16 19.1	5.576
8	18 22 17.84	2.2428	27 9 30.7	0.771	8	20 10 27.86	2.2398	25 10 40.6	5.708
9	18 24 32.45	2.2443	27 10 13.0	0.638	9	20 12 42.20	2.2383	25 4 54.2	5.839
10	18 26 47.15	2.2457	27 10 47.2	0.503	10	20 14 56.45	2.2368	24 58 59.9	5.971
11	18 29 1.93	2.2470	27 11 13.4	0.369	11	20 17 10.61	2.2353	24 52 57.7	6.102
12	18 31 16.79	2.2483	27 11 31.5	0.235	12	20 19 24.68	2.2337	24 46 47.7	6.232
13	18 33 31.73	2.2496	27 11 41.6	-0.101	13	20 21 38.65	2.2320	24 40 29.9	6.362
14	18 35 46.74	2.2508	27 11 43.6	+0.034	14	20 23 52.52	2.2303	24 34 4.3	6.491
15	18 38 1.82	2.2518	27 11 37.5	0.169	15	20 26 6.29	2.2287	24 27 31.0	6.620
16	18 40 16.96	2.2528	27 11 23.3	0.304	16	20 28 19.96	2.2269	24 20 49.9	6.749
17	18 42 32.16	2.2538	27 11 1.0	0.439	17	20 30 33.52	2.2251	24 14 1.1	6.878
18	18 44 47.41	2.2547	27 10 30.6	0.574	18	20 32 46.97	2.2233	24 7 4.6	7.006
19	18 47 2.72	2.2555	27 9 52.1	0.710	19	20 35 0.31	2.2215	24 0 0.4	7.133
20	18 49 18.07	2.2562	27 9 5.4	0.846	20	20 37 13.55	2.2197	23 52 48.6	7.260
21	18 51 33.46	2.2568	27 8 10.6	0.982	21	20 39 26.67	2.2178	23 45 29.2	7.387
22	18 53 48.89	2.2575	27 7 7.6	1.118	22	20 41 39.68	2.2158	23 38 2.2	7.513
23	18 56 4.36	2.2580	27 5 56.5	1.253	23	20 43 52.57	2.2139	23 30 27.7	7.638
24	18 58 19.85	2.2584	S. 27 4 37.2	1.390	24	20 46 5.35	2.2120	S. 23 22 45.7	7.763

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 9.					FRIDAY 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	20 46 5.35	2.2120	S. 23 22 45.7	7.763	0	22 29 56.82	2.1207	S. 14 57 14.9	13.033
1	20 48 18.01	2.2100	23 14 56.1	7.888	1	22 32 4.02	2.1194	14 44 10.2	13.124
2	20 50 30.55	2.2080	23 6 59.1	8.013	2	22 34 11.15	2.1182	14 31 0.0	13.215
3	20 52 42.97	2.2060	22 58 54.6	8.136	3	22 36 18.21	2.1170	14 17 44.4	13.305
4	20 54 55.27	2.2040	22 50 42.8	8.258	4	22 38 25.19	2.1158	14 4 23.4	13.393
5	20 57 7.45	2.2019	22 42 23.6	8.382	5	22 40 32.11	2.1146	13 50 57.2	13.481
6	20 59 19.50	2.1998	22 33 57.0	8.503	6	22 42 38.96	2.1137	13 37 25.7	13.568
7	21 1 31.43	2.1978	22 25 23.2	8.624	7	22 44 45.75	2.1127	13 23 49.1	13.653
8	21 3 43.24	2.1958	22 16 42.1	8.746	8	22 46 52.48	2.1118	13 10 7.3	13.738
9	21 5 54.92	2.1937	22 7 53.7	8.867	9	22 48 59.16	2.1109	12 56 20.5	13.822
10	21 8 6.48	2.1916	21 58 58.1	8.986	10	22 51 5.79	2.1100	12 42 28.7	13.905
11	21 10 17.91	2.1895	21 49 55.4	9.105	11	22 53 12.36	2.1092	12 28 31.9	13.987
12	21 12 29.22	2.1874	21 40 45.5	9.224	12	22 55 18.89	2.1085	12 14 30.2	14.068
13	21 14 40.40	2.1853	21 31 28.5	9.342	13	22 57 25.38	2.1078	12 0 23.7	14.148
14	21 16 51.45	2.1832	21 22 4.5	9.458	14	22 59 31.83	2.1072	11 46 12.4	14.228
15	21 19 2.38	2.1811	21 12 33.5	9.576	15	23 1 38.24	2.1066	11 31 56.4	14.306
16	21 21 13.18	2.1790	21 2 55.4	9.693	16	23 3 44.62	2.1061	11 17 35.7	14.383
17	21 23 23.86	2.1769	20 53 10.4	9.808	17	23 5 50.97	2.1057	11 3 10.5	14.458
18	21 25 34.41	2.1748	20 43 18.5	9.923	18	23 7 57.30	2.1053	10 48 40.7	14.534
19	21 27 44.83	2.1727	20 33 19.7	10.037	19	23 10 3.61	2.1050	10 34 6.4	14.608
20	21 29 55.13	2.1706	20 23 14.1	10.150	20	23 12 9.90	2.1048	10 19 27.7	14.681
21	21 32 5.30	2.1685	20 13 1.7	10.263	21	23 14 16.18	2.1046	10 4 44.7	14.753
22	21 34 15.35	2.1665	20 2 42.5	10.376	22	23 16 22.45	2.1044	9 49 57.4	14.823
23	21 36 25.28	2.1644	S. 19 52 16.6	10.488	23	23 18 28.71	2.1043	S. 9 35 5.9	14.893
THURSDAY 10.					SATURDAY 12.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 38 35.08	2.1623	S. 19 41 44.0	10.598	0	23 20 34.97	2.1043	S. 9 20 10.2	14.962
1	21 40 44.76	2.1603	19 31 4.8	10.708	1	23 22 41.23	2.1044	9 5 10.5	15.029
2	21 42 54.32	2.1583	19 20 19.0	10.818	2	23 24 47.50	2.1046	8 50 6.7	15.096
3	21 45 3.76	2.1563	19 9 26.7	10.927	3	23 26 53.78	2.1048	8 34 59.0	15.161
4	21 47 13.08	2.1543	18 58 27.8	11.035	4	23 29 0.08	2.1051	8 19 47.4	15.225
5	21 49 22.28	2.1524	18 47 22.5	11.142	5	23 31 6.39	2.1054	8 4 32.0	15.288
6	21 51 31.37	2.1505	18 36 10.8	11.248	6	23 33 12.73	2.1058	7 49 12.9	15.349
7	21 53 40.34	2.1486	18 24 52.7	11.354	7	23 35 19.09	2.1063	7 33 50.1	15.410
8	21 55 49.20	2.1467	18 13 28.3	11.459	8	23 37 25.48	2.1068	7 18 23.7	15.470
9	21 57 57.94	2.1448	18 1 57.6	11.564	9	23 39 31.91	2.1075	7 2 53.7	15.528
10	22 0 6.57	2.1429	17 50 20.6	11.668	10	23 41 38.38	2.1082	6 47 20.3	15.585
11	22 2 15.09	2.1412	17 38 37.5	11.770	11	23 43 44.89	2.1089	6 31 43.5	15.641
12	22 4 23.51	2.1394	17 26 48.2	11.872	12	23 45 51.45	2.1098	6 16 3.4	15.695
13	22 6 31.82	2.1377	17 14 52.8	11.973	13	23 47 58.06	2.1107	6 0 20.1	15.748
14	22 8 40.03	2.1359	17 2 51.4	12.073	14	23 50 4.73	2.1118	5 44 33.6	15.801
15	22 10 48.13	2.1342	16 50 44.0	12.173	15	23 52 11.47	2.1128	5 28 44.0	15.852
16	22 12 56.13	2.1326	16 38 30.6	12.273	16	23 54 18.27	2.1139	5 12 51.4	15.901
17	22 15 4.04	2.1310	16 26 11.3	12.371	17	23 56 25.14	2.1152	4 56 55.9	15.949
18	22 17 11.85	2.1294	16 13 46.1	12.468	18	23 58 32.09	2.1165	4 40 57.5	15.997
19	22 19 19.57	2.1278	16 1 15.1	12.564	19	0 0 39.12	2.1179	4 24 56.3	16.042
20	22 21 27.19	2.1263	15 48 38.4	12.659	20	0 2 46.24	2.1193	4 8 52.5	16.086
21	22 23 34.72	2.1248	15 35 56.0	12.754	21	0 4 53.44	2.1208	3 52 46.0	16.129
22	22 25 42.17	2.1235	15 23 7.9	12.848	22	0 7 0.74	2.1225	3 36 37.0	16.171
23	22 27 49.54	2.1221	15 10 14.2	12.942	23	0 9 8.14	2.1243	3 20 25.5	16.211
24	22 29 56.82	2.1207	S. 14 57 14.9	13.033	24	0 11 15.65	2.1261	S. 3 4 11.7	16.249

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 13.					TUESDAY 15.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	11 15.65	2.1261	S. 3 4 11.7	16.249	0	1 56 55.96	2.3083	N. 10 9 58.1	16.151
1	13 23.27	2.1279	2 47 55.6	16.287	1	59 14.63	2.3140	10 26 5.7	16.102
2	15 31.00	2.1298	2 31 37.3	16.323	2	1 33.64	2.3198	10 42 10.3	16.051
3	17 38.85	2.1318	2 15 16.9	16.357	3	2 53.00	2.3256	10 58 11.8	15.997
4	19 46.82	2.1339	1 58 54.5	16.389	4	2 6 12.71	2.3315	11 14 10.0	15.941
5	21 54.92	2.1361	1 42 30.2	16.421	5	2 8 32.78	2.3375	11 30 4.7	15.883
6	24 3.15	2.1383	1 26 4.0	16.451	6	2 10 53.21	2.3435	11 45 56.0	15.823
7	26 11.52	2.1407	1 9 36.1	16.479	7	2 13 14.00	2.3496	12 1 43.5	15.760
8	28 20.04	2.1433	0 53 6.5	16.507	8	2 15 35.16	2.3557	12 17 27.2	15.696
9	30 28.71	2.1458	0 36 35.3	16.532	9	2 17 56.68	2.3618	12 33 7.0	15.629
10	32 37.53	2.1483	0 20 2.7	16.556	10	2 20 18.58	2.3682	12 48 42.7	15.560
11	34 46.51	2.1510	S. 0 3 28.6	16.578	11	2 22 40.86	2.3744	13 4 14.2	15.488
12	36 55.65	2.1538	N. 0 13 6.7	16.598	12	2 25 3.51	2.3807	13 19 41.3	15.415
13	39 4.96	2.1567	0 29 43.2	16.618	13	2 27 26.54	2.3871	13 35 4.0	15.339
14	41 14.45	2.1596	0 46 20.8	16.635	14	2 29 49.96	2.3936	13 50 22.0	15.261
15	43 24.11	2.1626	1 2 59.4	16.651	15	2 32 12.77	2.4001	14 5 35.3	15.181
16	45 33.96	2.1658	1 19 38.9	16.666	16	2 34 37.97	2.4066	14 20 43.7	15.098
17	47 44.00	2.1689	1 36 19.3	16.678	17	2 37 2.56	2.4131	14 35 47.0	15.013
18	49 54.23	2.1722	1 53 0.3	16.688	18	2 39 27.54	2.4197	14 50 45.2	14.925
19	52 4.66	2.1756	2 9 41.9	16.698	19	2 41 52.92	2.4263	15 5 38.0	14.835
20	54 15.30	2.1790	2 26 24.0	16.705	20	2 44 18.70	2.4330	15 20 25.4	14.743
21	56 26.14	2.1825	2 43 6.5	16.711	21	2 46 44.88	2.4397	15 35 7.2	14.649
22	58 37.20	2.1862	2 59 49.3	16.715	22	2 49 11.46	2.4463	15 49 43.3	14.552
23	1 0 48.48	2.1898	N. 3 16 32.3	16.717	23	2 51 38.44	2.4531	N. 16 4 13.5	14.453
MONDAY 14.					WEDNESDAY 16.				
0	I 2 59.98	2.1936	N. 3 33 15.3	16.717	0	2 54 5.83	2.4599	N. 16 18 37.7	14.352
1	I 5 11.71	2.1974	3 49 58.3	16.716	1	2 56 33.63	2.4667	16 32 55.8	14.249
2	I 7 23.67	2.2014	4 6 41.2	16.713	2	2 59 1.83	2.4734	16 47 7.6	14.143
3	I 9 35.88	2.2055	4 23 23.8	16.708	3	3 1 30.44	2.4803	17 1 12.9	14.034
4	I 11 48.33	2.2096	4 40 6.1	16.701	4	3 3 59.46	2.4871	17 15 11.7	13.924
5	I 14 1.03	2.2138	4 56 47.9	16.692	5	3 6 28.89	2.4938	17 29 3.8	13.812
6	I 16 13.98	2.2180	5 13 29.1	16.681	6	3 8 58.72	2.5007	17 42 49.1	13.697
7	I 18 27.19	2.2223	5 30 9.6	16.668	7	3 11 28.97	2.5075	17 56 27.4	13.579
8	I 20 40.66	2.2268	5 46 49.3	16.654	8	3 13 59.62	2.5143	18 9 58.6	13.459
9	I 22 54.40	2.2313	6 3 28.1	16.638	9	3 16 30.68	2.5211	18 23 22.5	13.337
10	I 25 8.42	2.2359	6 20 5.9	16.620	10	3 19 2.15	2.5279	18 36 39.1	13.213
11	I 27 22.71	2.2406	6 36 42.5	16.599	11	3 21 34.03	2.5347	18 49 48.1	13.087
12	I 29 37.29	2.2454	6 53 17.8	16.577	12	3 24 6.31	2.5414	19 2 49.5	12.958
13	I 31 52.16	2.2502	7 9 51.8	16.553	13	3 26 39.00	2.5482	19 15 43.1	12.827
14	I 34 7.31	2.2550	7 26 24.2	16.527	14	3 29 12.09	2.5548	19 28 28.8	12.694
15	I 36 22.76	2.2601	7 42 55.0	16.498	15	3 31 45.58	2.5616	19 41 6.4	12.559
16	I 38 38.52	2.2652	7 59 24.0	16.468	16	3 34 19.48	2.5683	19 53 35.9	12.422
17	I 40 54.58	2.2703	8 15 51.2	16.436	17	3 36 53.78	2.5749	20 5 57.1	12.282
18	I 43 10.95	2.2755	8 32 16.3	16.401	18	3 39 28.47	2.5814	20 18 9.8	12.140
19	I 45 27.64	2.2808	8 48 39.3	16.365	19	3 42 3.55	2.5879	20 30 13.9	11.996
20	I 47 44.65	2.2862	9 5 0.1	16.327	20	3 44 39.02	2.5944	20 42 9.3	11.850
21	I 50 1.98	2.2916	9 21 18.5	16.286	21	3 47 14.88	2.6008	20 53 55.9	11.702
22	I 52 19.64	2.2971	9 37 34.4	16.243	22	3 49 51.12	2.6073	21 5 33.5	11.552
23	I 54 37.63	2.3027	9 53 47.6	16.198	23	3 52 27.75	2.6136	21 17 2.1	11.400
24	I 56 55.96	2.3083	N. 10 9 58.1	16.151	24	3 55 4.75	2.6198	N. 21 28 21.5	11.246

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 17.					SATURDAY 19.				
0	h m s	s	N. 21 28 21.5	11.246	0	h m s	s	N. 26 59 57.4	2.162
1	3 55 4.75	2.6198	21 39 31.6	11.089	1	6 5 50.89	2.7684	27 2 0.9	1.957
2	3 57 42.13	2.6260	21 50 32.2	10.931	2	6 8 36.96	2.7672	27 3 52.2	1.752
3	4 0 19.87	2.6321	22 1 23.3	10.771	3	6 11 22.95	2.7657	27 5 31.1	1.547
4	4 2 57.98	2.6382	22 12 4.7	10.608	4	6 14 8.84	2.7639	27 6 57.8	1.343
5	4 5 36.45	2.6441	22 22 36.3	10.444	5	6 16 54.62	2.7621	27 8 12.3	1.139
6	4 8 15.27	2.6499	22 32 58.0	10.278	6	6 19 40.29	2.7600	27 9 14.5	0.935
7	4 10 54.44	2.6557	22 43 9.7	10.110	7	6 22 25.82	2.7577	27 10 4.5	0.733
8	4 13 33.96	2.6614	22 53 11.2	9.941	8	6 25 11.21	2.7553	27 10 42.4	0.530
9	4 16 13.81	2.6670	23 3 2.6	9.770	9	6 27 56.45	2.7526	27 11 8.1	0.328
10	4 18 54.00	2.6725	23 12 43.6	9.597	10	6 30 41.52	2.7498	27 11 21.7	0.127
11	4 21 34.51	2.6778	23 22 14.2	9.422	11	6 33 26.42	2.7468	27 11 23.3	0.073
12	4 24 15.34	2.6831	23 31 34.2	9.245	12	6 36 11.13	2.7435	27 11 12.9	0.273
13	4 26 56.48	2.6883	23 40 43.6	9.067	13	6 38 55.64	2.7401	27 10 50.5	0.473
14	4 29 37.93	2.6933	23 49 42.3	8.888	14	6 41 39.94	2.7364	27 10 16.2	0.671
15	4 32 19.68	2.6982	23 58 30.1	8.706	15	6 44 24.01	2.7326	27 9 30.0	0.868
16	4 35 1.72	2.7030	24 7 7.0	8.523	16	6 47 7.85	2.7287	27 8 32.0	1.064
17	4 37 44.04	2.7077	24 15 32.9	8.339	17	6 49 51.45	2.7245	27 7 22.3	1.260
18	4 40 26.64	2.7122	24 23 47.7	8.153	18	6 52 34.79	2.7202	27 6 0.8	1.455
19	4 43 9.50	2.7165	24 31 51.3	7.966	19	6 55 17.87	2.7157	27 4 27.7	1.648
20	4 45 52.62	2.7207	24 39 43.6	7.778	20	6 58 0.67	2.7109	27 2 43.0	1.840
21	4 48 35.99	2.7248	24 47 24.6	7.588	21	7 0 43.18	2.7061	27 0 46.9	2.031
22	4 51 19.60	2.7288	24 54 54.2	7.398	22	7 3 25.40	2.7011	26 58 39.3	2.222
23	4 54 3.45	2.7327	N. 25 2 12.3	7.206	23	7 6 7.31	2.6959	N. 26 56 20.3	2.411
24	4 56 47.52	2.7363				7 8 48.91	2.6906		
FRIDAY 18.					SUNDAY 20.				
0	4 59 31.80	2.7398	N. 25 9 18.9	7.013	0	7 11 30.18	2.6850	N. 26 53 50.0	2.598
1	5 2 16.29	2.7431	25 16 13.8	6.818	1	7 14 11.11	2.6793	26 51 8.5	2.784
2	5 5 0.97	2.7462	25 22 57.0	6.623	2	7 16 51.70	2.6736	26 48 15.9	2.969
3	5 7 45.83	2.7491	25 29 28.5	6.426	3	7 19 31.94	2.6676	26 45 12.2	3.153
4	5 10 30.86	2.7519	25 35 48.1	6.228	4	7 22 11.81	2.6614	26 41 57.6	3.335
5	5 13 16.06	2.7546	25 41 55.9	6.031	5	7 24 51.31	2.6552	26 38 32.0	3.517
6	5 16 1.41	2.7570	25 47 51.8	5.832	6	7 27 30.44	2.6489	26 34 55.6	3.696
7	5 18 46.90	2.7593	25 53 35.7	5.632	7	7 30 9.18	2.6424	26 31 8.5	3.874
8	5 21 32.52	2.7613	25 59 7.6	5.431	8	7 32 47.53	2.6358	26 27 10.7	4.051
9	5 24 18.26	2.7633	26 4 27.4	5.229	9	7 35 25.48	2.6291	26 23 2.4	4.226
10	5 27 4.11	2.7650	26 9 35.1	5.028	10	7 38 3.02	2.6222	26 18 43.6	4.399
11	5 29 50.06	2.7665	26 14 30.7	4.825	11	7 40 40.15	2.6152	26 14 14.4	4.572
12	5 32 36.09	2.7678	26 19 14.1	4.622	12	7 43 16.85	2.6081	26 9 35.0	4.743
13	5 35 22.20	2.7690	26 23 45.3	4.418	13	7 45 53.12	2.6009	26 4 45.4	4.911
14	5 38 8.37	2.7700	26 28 4.2	4.213	14	7 48 28.96	2.5936	25 59 45.7	5.078
15	5 40 54.60	2.7708	26 32 10.9	4.009	15	7 51 4.35	2.5862	25 54 36.0	5.243
16	5 43 40.86	2.7713	26 36 5.3	3.805	16	7 53 39.30	2.5788	25 49 16.5	5.407
17	5 46 27.15	2.7716	26 39 47.5	3.600	17	7 56 13.80	2.5712	25 43 47.2	5.569
18	5 49 13.45	2.7718	26 43 17.3	3.394	18	7 58 47.84	2.5635	25 38 8.2	5.731
19	5 51 59.76	2.7717	26 46 34.8	3.189	19	8 1 21.42	2.5558	25 32 19.5	5.890
20	5 54 46.05	2.7713	26 49 40.0	2.983	20	8 3 54.54	2.5480	25 26 21.4	6.047
21	5 57 32.32	2.7709	26 52 32.8	2.778	21	8 6 27.18	2.5401	25 20 13.9	6.203
22	6 0 18.56	2.7703	26 55 13.3	2.573	22	8 8 59.35	2.5322	25 13 57.1	6.356
23	6 3 4.75	2.7694	26 57 41.5	2.368	23	8 11 31.04	2.5241	25 7 31.2	6.508
24	6 5 50.89	2.7684	N. 26 59 57.4	2.162	24	8 14 2.24	2.5160	N. 25 0 56.2	6.658



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 21.					WEDNESDAY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	8 14 2.24	2.5160	N. 25 0 56.2	6.658	0	10 5 10.71	2.1226	N. 17 21 47.2	11.823
1	8 16 32.96	2.5078	24 54 12.2	6.807	1	10 7 17.85	2.1154	17 9 55.8	11.891
2	8 19 3.18	2.4996	24 47 19.4	6.953	2	10 9 24.56	2.1083	16 58 0.3	11.958
3	8 21 32.91	2.4914	24 40 17.8	7.098	3	10 11 30.84	2.1011	16 46 0.8	12.023
4	8 24 2.15	2.4832	24 33 7.6	7.241	4	10 13 36.69	2.0940	16 33 57.5	12.087
5	8 26 30.89	2.4748	24 25 48.9	7.383	5	10 15 42.12	2.0871	16 21 50.4	12.150
6	8 28 59.13	2.4664	24 18 21.7	7.523	6	10 17 47.14	2.0803	16 9 39.5	12.212
7	8 31 26.86	2.4581	24 10 46.2	7.660	7	10 19 51.75	2.0734	15 57 25.0	12.272
8	8 33 54.09	2.4496	24 3 2.5	7.796	8	10 21 55.95	2.0667	15 45 6.9	12.330
9	8 36 20.81	2.4411	23 55 10.7	7.930	9	10 23 59.75	2.0600	15 32 45.4	12.387
10	8 38 47.02	2.4326	23 47 10.9	8.063	10	10 26 3.15	2.0534	15 20 20.5	12.443
11	8 41 12.72	2.4241	23 39 3.2	8.193	11	10 28 6.16	2.0469	15 7 52.2	12.498
12	8 43 37.91	2.4156	23 30 47.7	8.322	12	10 30 8.78	2.0405	14 55 20.7	12.552
13	8 46 2.59	2.4071	23 22 24.6	8.448	13	10 32 11.02	2.0341	14 42 46.0	12.603
14	8 48 26.76	2.3985	23 13 53.9	8.574	14	10 34 12.87	2.0278	14 30 8.3	12.654
15	8 50 50.41	2.3899	23 5 15.7	8.698	15	10 36 14.35	2.0216	14 17 27.5	12.704
16	8 53 13.55	2.3814	22 56 30.2	8.819	16	10 38 15.46	2.0155	14 4 43.8	12.753
17	8 55 36.18	2.3729	22 47 37.4	8.939	17	10 40 16.21	2.0095	13 51 57.2	12.800
18	8 57 58.30	2.3644	22 38 37.5	9.057	18	10 42 16.60	2.0035	13 39 7.8	12.847
19	9 0 19.91	2.3558	22 29 30.6	9.173	19	10 44 16.63	1.9976	13 26 15.6	12.893
20	9 2 41.00	2.3473	22 20 16.7	9.288	20	10 46 16.31	1.9918	13 13 20.7	12.936
21	9 5 1.58	2.3388	22 10 56.0	9.401	21	10 48 15.65	1.9861	13 0 23.3	12.978
22	9 7 21.65	2.3303	22 1 28.6	9.512	22	10 50 14.64	1.9804	12 47 23.4	13.019
23	9 9 41.21	2.3218	N. 21 51 54.6	9.622	23	10 52 13.30	1.9748	N. 12 34 21.0	13.060
TUESDAY 22.					THURSDAY 24.				
0	9 12 0.26	2.3133	N. 21 42 14.1	9.739	0	10 54 11.62	1.9693	N. 12 21 16.2	13.099
1	9 14 18.80	2.3048	21 32 27.1	9.835	1	10 56 9.62	1.9640	12 8 9.1	13.138
2	9 16 36.84	2.2965	21 22 33.8	9.939	2	10 58 7.30	1.9587	11 54 59.7	13.175
3	9 18 54.38	2.2882	21 12 34.4	10.041	3	11 0 4.66	1.9534	11 41 48.1	13.211
4	9 21 11.42	2.2798	21 2 28.9	10.142	4	11 2 1.71	1.9483	11 28 34.4	13.245
5	9 23 27.96	2.2715	20 52 17.3	10.242	5	11 3 58.45	1.9432	11 15 18.7	13.279
6	9 25 44.00	2.2632	20 41 59.9	10.340	6	11 5 54.89	1.9383	11 2 0.9	13.312
7	9 27 59.54	2.2549	20 31 36.6	10.435	7	11 7 51.04	1.9333	10 48 41.2	13.344
8	9 30 14.59	2.2468	20 21 7.7	10.528	8	11 9 46.89	1.9285	10 35 19.6	13.375
9	9 32 29.15	2.2386	20 10 33.2	10.622	9	11 11 42.46	1.9238	10 21 56.2	13.404
10	9 34 43.22	2.2305	19 59 53.1	10.713	10	11 13 37.75	1.9192	10 8 31.1	13.433
11	9 36 56.81	2.2224	19 49 7.6	10.803	11	11 15 32.76	1.9146	9 55 4.2	13.462
12	9 39 9.91	2.2143	19 38 16.8	10.890	12	11 17 27.50	1.9101	9 41 35.7	13.488
13	9 41 22.53	2.2064	19 27 20.8	10.976	13	11 19 21.97	1.9057	9 28 5.6	13.514
14	9 43 34.68	2.1985	19 16 19.7	11.060	14	11 21 16.18	1.9014	9 14 34.0	13.539
15	9 45 46.35	2.1907	19 5 13.6	11.143	15	11 23 10.14	1.8972	9 1 0.9	13.563
16	9 47 57.56	2.1829	18 54 2.5	11.225	16	11 25 3.84	1.8930	8 47 26.4	13.586
17	9 50 8.30	2.1752	18 42 46.6	11.305	17	11 26 57.30	1.8890	8 33 50.6	13.608
18	9 52 18.58	2.1674	18 31 25.9	11.383	18	11 28 50.52	1.8850	8 20 13.5	13.628
19	9 54 28.39	2.1598	18 20 0.6	11.460	19	11 30 43.50	1.8811	8 6 35.2	13.649
20	9 56 37.75	2.1523	18 8 30.7	11.536	20	11 32 36.25	1.8773	7 52 55.6	13.669
21	9 58 46.66	2.1448	17 56 56.4	11.610	21	11 34 28.77	1.8735	7 39 14.9	13.687
22	10 0 55.12	2.1373	17 45 17.6	11.682	22	11 36 21.07	1.8698	7 25 33.2	13.704
23	10 3 3.14	2.1299	17 33 34.5	11.753	23	11 38 13.15	1.8663	7 11 50.4	13.721
24	10 5 10.71	2.1226	N. 17 21 47.2	11.823	24	11 40 5.02	1.8628	N. 6 58 6.7	13.736

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 25.					SUNDAY 27.				
0	11 40 5.02	1.8628	N. 6 58 6.7	13.736	0	13 6 59.53	1.7878	S. 4 4 10.5	13.571
1	11 41 56.69	1.8594	6 44 22.1	13.751	1	13 8 46.80	1.7880	4 17 44.1	13.549
2	11 43 48.15	1.8561	6 30 36.6	13.766	2	13 10 34.09	1.7883	4 31 16.4	13.528
3	11 45 39.42	1.8528	6 16 50.2	13.779	3	13 12 21.40	1.7888	4 44 47.4	13.505
4	11 47 30.49	1.8496	6 3 3.1	13.791	4	13 14 8.74	1.7893	4 58 17.0	13.482
5	11 49 21.37	1.8465	5 49 15.3	13.802	5	13 15 56.10	1.7897	5 11 45.2	13.458
6	11 51 12.07	1.8436	5 35 26.8	13.813	6	13 17 43.50	1.7902	5 25 11.9	13.433
7	11 53 2.60	1.8407	5 21 37.7	13.823	7	13 19 30.93	1.7908	5 38 37.1	13.408
8	11 54 52.95	1.8378	5 7 48.0	13.832	8	13 21 18.40	1.7916	5 52 0.8	13.382
9	11 56 43.14	1.8351	4 53 57.8	13.840	9	13 23 5.92	1.7924	6 5 22.9	13.354
10	11 58 33.16	1.8324	4 40 7.2	13.848	10	13 24 53.49	1.7933	6 18 43.3	13.327
11	12 0 23.03	1.8298	4 26 16.1	13.854	11	13 26 41.11	1.7944	6 32 2.1	13.299
12	12 2 12.74	1.8273	4 12 24.7	13.859	12	13 28 28.79	1.7952	6 45 19.2	13.270
13	12 4 2.30	1.8248	3 58 33.0	13.864	13	13 30 16.53	1.7963	6 58 34.5	13.240
14	12 5 51.72	1.8225	3 44 41.0	13.869	14	13 32 4.34	1.7973	7 11 48.0	13.209
15	12 7 41.00	1.8203	3 30 48.7	13.873	15	13 33 52.21	1.7985	7 24 59.6	13.178
16	12 9 30.15	1.8181	3 16 56.3	13.875	16	13 35 40.16	1.7998	7 38 9.3	13.146
17	12 11 19.17	1.8159	3 3 3.7	13.877	17	13 37 28.18	1.8010	7 51 17.1	13.114
18	12 13 8.06	1.8138	2 49 11.0	13.878	18	13 39 16.28	1.8024	8 4 23.0	13.081
19	12 14 56.83	1.8119	2 35 18.3	13.878	19	13 41 4.47	1.8038	8 17 26.8	13.046
20	12 16 45.49	1.8101	2 21 25.6	13.878	20	13 42 52.74	1.8053	8 30 28.5	13.011
21	12 18 34.04	1.8083	2 7 33.0	13.877	21	13 44 41.11	1.8069	8 43 28.1	12.976
22	12 20 22.48	1.8065	1 53 40.4	13.875	22	13 46 29.57	1.8085	8 56 25.6	12.940
23	12 22 10.82	1.8048	N. 1 39 48.0	13.873	23	13 48 18.13	1.8102	S. 9 9 20.9	12.903
SATURDAY 26.					MONDAY 28.				
0	12 23 59.06	1.8033	N. 1 25 55.7	13.869	0	13 50 6.79	1.8119	S. 9 22 13.9	12.855
1	12 25 47.21	1.8018	1 12 3.7	13.865	1	13 51 55.56	1.8137	9 35 4.7	12.827
2	12 27 35.27	1.8003	0 58 11.9	13.860	2	13 53 44.43	1.8155	9 47 53.1	12.788
3	12 29 23.25	1.7990	0 44 20.5	13.854	3	13 55 33.42	1.8175	10 0 39.2	12.748
4	12 31 11.15	1.7977	0 30 29.4	13.848	4	13 57 22.53	1.8195	10 13 22.9	12.708
5	12 32 58.97	1.7965	0 16 38.7	13.841	5	13 59 11.76	1.8215	10 26 4.1	12.666
6	12 34 46.73	1.7954	N. 0 2 48.5	13.833	6	14 1 1.11	1.8235	10 38 42.8	12.624
7	12 36 34.42	1.7943	S. 0 11 1.2	13.824	7	14 2 50.58	1.8257	10 51 19.0	12.582
8	12 38 22.05	1.7934	0 24 50.4	13.816	8	14 4 40.19	1.8279	11 3 52.6	12.538
9	12 40 9.63	1.7925	0 38 39.1	13.806	9	14 6 29.93	1.8302	11 16 23.5	12.493
10	12 41 57.15	1.7917	0 52 27.1	13.794	10	14 8 19.81	1.8324	11 28 51.7	12.448
11	12 43 44.63	1.7910	1 6 14.4	13.783	11	14 10 9.82	1.8348	11 41 17.2	12.403
12	12 45 32.07	1.7903	1 20 1.1	13.772	12	14 11 59.98	1.8373	11 53 40.0	12.356
13	12 47 19.47	1.7897	1 33 47.0	13.758	13	14 13 50.29	1.8397	12 5 59.9	12.308
14	12 49 6.83	1.7891	1 47 32.1	13.745	14	14 15 40.74	1.8422	12 18 17.0	12.261
15	12 50 54.16	1.7887	2 1 16.4	13.731	15	14 17 31.35	1.8448	12 30 31.2	12.212
16	12 52 41.47	1.7882	2 14 59.8	13.716	16	14 19 22.12	1.8474	12 42 42.4	12.168
17	12 54 28.75	1.7879	2 28 42.3	13.700	17	14 21 13.04	1.8501	12 54 50.6	12.122
18	12 56 16.02	1.7878	2 42 23.8	13.683	18	14 23 4.13	1.8529	13 6 55.8	12.061
19	12 58 3.28	1.7876	2 56 4.3	13.667	19	14 24 55.39	1.8557	13 18 57.9	12.008
20	12 59 50.53	1.7874	3 9 43.8	13.649	20	14 26 46.81	1.8584	13 30 56.8	11.955
21	13 1 37.77	1.7874	3 23 22.2	13.631	21	14 28 38.40	1.8613	13 42 52.5	11.902
22	13 3 25.02	1.7875	3 36 59.5	13.612	22	14 30 30.17	1.8643	13 54 45.0	11.848
23	13 5 12.27	1.7876	3 50 35.6	13.592	23	14 32 22.12	1.8673	14 6 34.2	11.793
24	13 6 59.53	1.7878	S. 4 4 10.5	13.571	24	14 34 14.24	1.8703	S. 14 18 20.1	11.737

GREENWICH MEAN TIME.

### THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.		Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.		Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.			
TUESDAY 29.						THURSDAY, DECEMBER 1.								
0	h	m	s	°	'	11.737	0	h	m	s	°	'	"	"
1	14	34	14.24	1.8703	S. 14 18 20.1	11.680	16	8	11.14	2.0538	S. 22 21 43.4	8.082		
2	14	36	6.55	1.8733	14 30 2.6	11.623								
3	14	37	59.04	1.8764	14 41 41.7	11.564								
4	14	39	51.72	1.8796	14 53 17.3	11.505								
5	14	41	44.59	1.8828	15 4 49.4	11.445								
6	14	43	37.65	1.8860	15 16 17.9	11.385								
7	14	45	30.91	1.8893	15 27 42.8	11.323								
8	14	47	24.37	1.8927	15 39 4.1	11.261								
9	14	49	18.03	1.8960	15 50 21.6	11.198								
10	14	51	11.89	1.8994	16 1 35.4	11.133								
11	14	53	5.96	1.9029	16 12 45.3	11.069								
12	14	55	0.24	1.9064	16 23 51.4	11.003								
13	14	56	54.73	1.9099	16 34 53.6	10.937								
14	14	58	49.43	1.9135	16 45 51.8	10.870								
15	15	0	44.35	1.9171	16 56 46.0	10.802								
16	15	2	39.48	1.9207	17 7 36.2	10.733								
17	15	4	34.83	1.9243	17 18 22.3	10.663								
18	15	6	30.40	1.9281	17 29 4.2	10.593								
19	15	8	26.20	1.9318	17 39 41.9	10.521								
20	15	10	22.22	1.9356	17 50 15.3	10.449								
21	15	12	18.47	1.9394	18 0 44.4	10.376								
22	15	14	14.95	1.9433	18 11 9.2	10.302								
23	15	16	11.66	1.9471	18 21 29.5	10.227								
	15	18	8.60	1.9509	S. 18 31 45.4									
WEDNESDAY 30.						PHASES OF THE MOON.								
0	15	20	5.77	1.9548	S. 18 41 56.7	10.151	●	New Moon	. . . . .	Nov.	1	13	56.1	
1	15	22	3.18	1.9588	18 52 3.5	10.075	☾	First Quarter	. . . . .		9	17	29.4	
2	15	24	0.83	1.9628	19 2 5.7	9.998	☾	Full Moon	. . . . .		16	12	25.0	
3	15	25	58.71	1.9668	19 12 3.2	9.919	☾	Last Quarter	. . . . .		23	6	13.4	
4	15	27	56.84	1.9708	19 21 56.0	9.841								
5	15	29	55.20	1.9748	19 31 44.1	9.761								
6	15	31	53.81	1.9788	19 41 27.3	9.680								
7	15	33	52.66	1.9829	19 51 5.7	9.598								
8	15	35	51.76	1.9870	20 0 39.1	9.516								
9	15	37	51.10	1.9911	20 10 7.6	9.433								
10	15	39	50.69	1.9952	20 19 31.1	9.349								
11	15	41	50.52	1.9993	20 28 49.5	9.263								
12	15	43	50.60	2.0034	20 38 2.7	9.178								
13	15	45	50.93	2.0076	20 47 10.8	9.091								
14	15	47	51.51	2.0118	20 56 13.6	9.003								
15	15	49	52.34	2.0159	21 5 11.2	8.916								
16	15	51	53.42	2.0202	21 14 3.5	8.826								
17	15	53	54.76	2.0243	21 22 50.3	8.735								
18	15	55	56.34	2.0285	21 31 31.7	8.645								
19	15	57	58.18	2.0328	21 40 7.7	8.553								
20	16	0	0.27	2.0369	21 48 38.1	8.460								
21	16	2	2.61	2.0411	21 57 2.9	8.367								
22	16	4	5.20	2.0453	22 5 22.1	8.273								
23	16	6	8.04	2.0495	22 13 35.6	8.178								
24	16	8	11.14	2.0538	S. 22 21 43.4	8.082								

GREENWICH MEAN TIME.										
LUNAR DISTANCES.										
Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
3	SUN	W.	15 20 44	3463	16 41 49	3463	18 2 54	3463	19 23 58	3463
	Fomalhaut	E.	96 22 52	3247	94 57 38	3246	93 32 23	3247	92 7 9	3247
	α Pegasi	E.	115 18 0	3551	113 58 32	3541	112 38 53	3532	111 19 4	3523
4	SUN	W.	26 9 27	3461	27 30 35	3460	28 51 44	3459	30 12 54	3457
	Fomalhaut	E.	85 1 0	3247	83 35 47	3248	82 10 35	3248	80 45 23	3248
	α Pegasi	E.	104 37 47	3488	103 17 9	3482	101 56 25	3477	100 35 35	3472
5	SUN	W.	36 59 18	3445	38 20 43	3442	39 42 12	3438	41 3 45	3435
	Fomalhaut	E.	73 39 25	3249	72 14 14	3250	70 49 4	3250	69 23 54	3251
	α Pegasi	E.	93 50 4	3450	92 28 44	3446	91 7 20	3442	89 45 51	3439
6	SUN	W.	47 52 40	3411	49 14 44	3405	50 36 55	3399	51 59 13	3392
	Fomalhaut	E.	62 18 14	3254	60 53 9	3256	59 28 5	3258	58 3 4	3259
	α Pegasi	E.	82 57 37	3425	81 35 49	3423	80 13 58	3421	78 52 5	3419
	SATURN	E.	121 0 32	3004	119 30 24	2998	118 0 9	2993	116 29 47	2987
7	SUN	W.	58 52 45	3353	60 15 55	3344	61 39 15	3335	63 2 46	3325
	Fomalhaut	E.	50 58 36	3276	49 33 56	3281	48 9 22	3287	46 44 55	3293
	α Pegasi	E.	72 2 15	3414	70 40 14	3414	69 18 13	3414	67 56 12	3415
	SATURN	E.	108 55 57	2951	107 24 44	2943	105 53 20	2935	104 21 45	2926
	α Arietis	E.	113 47 25	3075	112 18 45	3065	110 49 52	3054	109 20 46	3044
8	SUN	W.	70 3 20	3270	71 28 6	3258	72 53 7	3245	74 18 22	3232
	Fomalhaut	E.	39 45 36	3361	38 22 35	3382	36 59 58	3407	35 37 49	3436
	α Pegasi	E.	61 6 38	3430	59 44 55	3435	58 23 18	3442	57 1 48	3450
	SATURN	E.	96 40 52	2876	95 8 2	2865	93 34 58	2853	92 1 39	2841
	α Arietis	E.	101 51 56	2987	100 21 27	2975	98 50 43	2962	97 19 43	2950
9	SUN	W.	81 28 42	3161	82 55 38	3145	84 22 53	3129	85 50 27	3113
	α Pegasi	E.	50 17 17	3518	48 57 13	3540	47 37 33	3564	46 18 19	3592
	SATURN	E.	84 11 1	2776	82 36 2	2762	81 0 44	2747	79 25 7	2732
	α Arietis	E.	89 40 39	2883	88 7 59	2869	86 35 0	2855	85 1 43	2840
	Aldebaran	E.	120 0 51	2846	118 27 23	2831	116 53 35	2815	115 19 27	2799
10	SUN	W.	93 13 20	3027	94 42 59	3009	96 13 0	2990	97 43 25	2972
	SATURN	E.	71 21 57	2654	69 44 15	2637	68 6 10	2620	66 27 42	2603
	α Arietis	E.	77 10 30	2765	75 35 16	2749	73 59 41	2734	72 23 46	2718
	Aldebaran	E.	107 23 25	2716	105 47 6	2698	104 10 23	2681	102 33 17	2663
11	SUN	W.	105 21 27	2875	106 54 18	2855	108 27 35	2835	110 1 17	2815
	α Aquilæ	W.	46 53 17	4453	47 57 51	4333	49 4 13	4221	50 12 19	4118
	SATURN	E.	58 9 26	2515	56 28 33	2496	54 47 13	2477	53 5 28	2459
	α Arietis	E.	64 18 57	2640	62 40 56	2625	61 2 35	2610	59 23 53	2595
	Aldebaran	E.	94 21 42	2572	92 42 9	2553	91 2 9	2534	89 21 44	2515
12	SUN	W.	117 56 26	2713	119 32 49	2693	121 9 38	2673	122 46 55	2653
	α Aquilæ	W.	56 15 53	3696	57 32 44	3628	58 50 48	3563	60 10 3	3501
	SATURN	E.	44 30 8	2366	42 45 44	2347	41 0 53	2328	39 15 35	2310
	α Arietis	E.	51 5 29	2528	49 24 55	2516	47 44 4	2506	46 2 58	2497
	Aldebaran	E.	80 53 5	2423	79 10 3	2404	77 26 34	2386	75 42 39	2368

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
3	SUN W. Fomalhaut E. α Pegasi E.	20 45 3 90 41 55 109 59 5	3463 3247 3515	22 6 8 89 16 41 108 38 58	3463 3247 3507	23 27 13 87 51 27 107 18 42	3462 3247 3500	24 48 20 86 26 13 105 58 18	3462 3247 3494
4	SUN W. Fomalhaut E. α Pegasi E.	31 34 6 79 20 11 99 14 39	3455 3248 3467	32 55 20 77 54 59 97 53 38	3453 3248 3462	34 16 36 76 29 48 96 32 31	3450 3248 3458	35 37 56 75 4 36 95 11 20	3448 3249 3454
5	SUN W. Fomalhaut E. α Pegasi E.	42 25 22 67 58 45 88 24 19	3431 3251 3436	43 47 4 66 33 36 87 2 43	3427 3252 3433	45 8 50 65 8 28 85 41 4	3422 3253 3431	46 30 42 63 43 21 84 19 22	3416 3253 3428
6	SUN W. Fomalhaut E. α Pegasi E. SATURN E.	53 21 39 56 38 4 77 30 10 114 59 18	3385 3261 3417 2980	54 44 12 55 13 6 76 8 13 113 28 41	3378 3264 3416 2973	56 6 54 53 48 12 74 46 15 111 57 55	3370 3267 3415 2966	57 29 45 52 23 22 73 24 15 110 27 0	3362 3271 3415 2959
7	SUN W. Fomalhaut E. α Pegasi E. SATURN E. α Arietis E.	64 26 28 45 20 38 66 34 12 102 49 59 107 51 28	3315 3304 3416 2916 3033	65 50 22 43 56 31 65 12 14 101 18 1 106 21 56	3305 3315 3419 2907 3022	67 14 28 42 32 37 63 50 18 99 45 51 104 52 10	3294 3328 3422 2897 3010	68 38 47 41 8 58 62 28 26 98 13 28 103 22 10	3282 3343 3426 2887 2999
8	SUN W. Fomalhaut E. α Pegasi E. SATURN E. α Arietis E.	75 43 53 34 16 13 55 40 28 90 28 4 95 48 27	3219 3471 3460 2828 2937	77 9 40 32 55 16 54 19 19 88 54 13 94 16 55	3205 3512 3471 2816 2924	78 35 43 31 35 5 52 58 22 87 20 6 92 45 7	3190 3562 3484 2803 2911	80 2 4 30 15 49 51 37 41 85 45 42 91 13 2	3176 3622 3500 2790 2897
9	SUN W. α Pegasi E. SATURN E. α Arietis E. Aldebaran E.	87 18 20 44 59 36 77 49 10 83 28 7 113 44 58	3096 3625 2717 2825 2783	88 46 34 43 41 29 76 12 53 81 54 12 112 10 8	3080 3663 2702 2810 2766	90 15 8 42 24 3 74 36 16 80 19 58 110 34 56	3063 3706 2686 2795 2750	91 44 3 41 7 26 72 59 17 78 45 24 108 59 22	3045 3754 2670 2780 2733
10	SUN W. SATURN E. α Arietis E. Aldebaran E.	99 14 13 64 48 51 70 47 30 100 55 47	2953 2586 2702 2645	100 45 25 63 9 37 69 10 53 99 17 53	2934 2568 2687 2626	102 17 1 61 29 58 67 33 55 97 39 34	2914 2550 2671 2608	103 49 2 59 49 54 65 56 36 96 0 50	2895 2533 2656 2591
11	SUN W. α Aquilæ W. SATURN E. α Arietis E. Aldebaran E.	111 35 26 51 22 3 51 23 17 57 44 50 87 40 52	2795 4023 2441 2580 2497	113 10 1 52 33 20 49 40 40 56 5 27 85 59 35	2775 3933 2422 2566 2478	114 45 2 53 46 7 47 57 36 54 25 46 84 17 51	2754 3848 2403 2553 2460	116 20 30 55 0 19 46 14 5 52 45 46 82 35 41	2733 3769 2384 2540 2411
12	SUN W. α Aquilæ W. SATURN E. α Arietis E. Aldebaran E.	124 24 38 61 30 26 37 29 50 44 21 40 73 58 18	2633 3444 2292 2489 2350	126 2 48 62 51 53 35 43 39 42 40 11 72 13 31	2613 3391 2274 2483 2332	127 41 25 64 14 20 33 57 1 40 58 34 70 28 18	2593 3340 2256 2479 2315	129 20 30 65 37 45 32 9 57 39 16 52 68 42 40	2574 3392 2238 2476 2298

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
13	<i>α</i> Aquilæ W.	67 2 7	3247	68 27 21	3205	69 53 24	3165	71 20 15	3127
	Fomalhaut W.	32 48 6	2856	34 21 21	2786	35 56 7	2722	37 32 18	2663
	SATURN E.	30 22 26	2221	28 34 29	2204	26 46 8	2188	24 57 22	2172
	Aldebaran E.	66 56 38	2281	65 10 11	2265	63 23 20	2249	61 36 5	2234
	Pollux E.	110 54 59	2243	109 7 36	2225	107 19 46	2208	105 31 30	2191
14	<i>α</i> Aquilæ W.	78 44 57	2975	80 15 41	2951	81 46 55	2929	83 18 37	2909
	Fomalhaut W.	45 50 35	2445	47 33 6	2411	49 16 25	2380	51 0 29	2352
	<i>α</i> Pegasi W.	32 13 11	3869	33 27 2	3688	34 44 2	3529	36 3 54	3391
	Aldebaran E.	52 34 26	2166	50 45 7	2155	48 55 31	2145	47 5 39	2136
	Pollux E.	96 24 0	2112	94 33 19	2098	92 42 17	2085	90 50 54	2071
15	<i>α</i> Aquilæ W.	91 2 29	2843	92 36 1	2836	94 9 42	2831	95 43 29	2829
	Fomalhaut W.	59 50 7	2239	61 37 36	2222	63 25 31	2206	65 13 50	2192
	<i>α</i> Pegasi W.	43 17 33	2906	44 49 44	2893	46 23 22	2779	47 58 18	2725
	Aldebaran E.	37 53 26	2108	36 2 39	2109	34 11 53	2111	32 21 10	2115
	Pollux E.	81 29 8	2015	79 35 56	2005	77 42 30	1996	75 48 50	1988
	Regulus E.	117 49 35	2031	115 56 49	2020	114 3 46	2011	112 10 29	2003
16	<i>α</i> Aquilæ W.	103 32 5	2855	105 5 22	2868	106 38 22	2884	108 11 1	2904
	Fomalhaut W.	74 20 4	2141	76 10 1	2135	78 0 7	2130	79 50 20	2126
	<i>α</i> Pegasi W.	56 8 33	2532	57 49 2	2504	59 30 9	2480	61 11 50	2460
	SATURN W.	14 33 0	1949	16 27 55	1944	18 22 58	1940	20 18 7	1937
	Pollux E.	66 17 47	1961	64 23 11	1958	62 28 31	1956	60 33 47	1954
	Regulus E.	102 41 16	1974	100 47 0	1970	98 52 39	1967	96 58 13	1966
17	Fomalhaut W.	89 2 14	2126	90 52 33	2130	92 42 46	2135	94 32 52	2141
	<i>α</i> Pegasi W.	69 46 14	2395	71 29 56	2389	73 13 47	2385	74 57 43	2382
	SATURN W.	29 54 27	1939	31 49 38	1942	33 44 44	1946	35 39 44	1951
	<i>α</i> Arietis W.	26 8 10	2386	27 52 5	2339	29 37 8	2301	31 23 7	2270
	Pollux E.	50 59 58	1960	49 5 20	1963	47 10 48	1968	45 16 23	1973
	Regulus E.	87 25 54	1971	85 31 34	1974	83 37 19	1979	81 43 11	1984
18	Fomalhaut W.	103 40 31	2188	105 29 17	2201	107 17 43	2215	109 5 48	2230
	<i>α</i> Pegasi W.	83 37 29	2395	85 21 10	2403	87 4 41	2412	88 47 59	2423
	SATURN W.	45 12 22	1987	47 6 17	1996	48 59 57	2006	50 53 22	2017
	<i>α</i> Arietis W.	40 21 17	2198	42 9 48	2194	43 58 24	2193	45 47 2	2193
	Pollux E.	35 46 55	2013	33 53 41	2023	32 0 43	2034	30 8 2	2046
	Regulus E.	72 14 58	2022	70 21 58	2032	68 29 13	2042	66 36 45	2053
19	<i>α</i> Pegasi W.	97 20 7	2494	99 1 28	2512	100 42 24	2533	102 22 52	2554
	SATURN W.	60 15 53	2080	62 7 22	2094	63 58 30	2109	65 49 15	2124
	<i>α</i> Arietis W.	54 49 13	2220	56 37 10	2230	58 24 53	2240	60 12 21	2250
	Aldebaran W.	24 27 35	2294	26 13 44	2285	28 0 6	2280	29 46 35	2279
	Regulus E.	57 19 8	2120	55 28 40	2136	53 38 36	2153	51 48 57	2169
	Spica E.	111 21 47	2114	109 31 9	2128	107 40 52	2143	105 50 58	2158
	JUPITER E.	120 11 2	2161	118 21 35	2175	116 32 29	2190	114 43 46	2206
20	SATURN W.	74 57 2	2206	76 45 20	2223	78 33 13	2241	80 20 40	2259
	<i>α</i> Arietis W.	69 5 11	2319	70 50 43	2334	72 35 53	2350	74 20 40	2366
	Aldebaran W.	38 37 59	2312	40 23 41	2323	42 9 7	2335	43 54 16	2348
	Regulus E.	42 47 6	2260	41 0 7	2280	39 13 37	2300	37 27 37	2321

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
13	α Aquilæ W.	72 47 52	3092	74 16 11	3060	75 45 9	3030	77 14 45	3001
	Fomalhaut W.	39 9 47	2612	40 48 26	2564	42 28 11	2580	44 8 56	2481
	SATURN E.	23 8 11	2156	21 18 37	2141	19 28 40	2127	17 38 22	2113
	Aldebaran E.	59 48 28	2219	58 0 28	2204	56 12 7	2191	54 23 26	2178
	Pollux E.	103 42 49	2174	101 53 43	2158	100 4 12	2143	98 14 18	2127
14	α Aquilæ W.	84 50 44	2892	86 23 13	2877	87 56 2	2863	89 29 8	2852
	Fomalhaut W.	52 45 13	2326	54 30 35	2300	56 16 34	2278	58 3 6	2258
	α Pegasi W.	37 26 21	3269	38 51 9	3161	40 18 5	3065	41 46 57	2981
	Aldebaran E.	45 15 34	2127	43 25 16	2120	41 34 47	2115	39 44 10	2110
	Pollux E.	88 59 10	2058	87 7 6	2046	85 14 44	2035	83 22 4	2025
15	α Aquilæ W.	97 17 19	2829	98 51 9	2832	100 24 55	2837	101 58 35	2845
	Fomalhaut W.	67 2 30	2179	68 51 29	2167	70 40 46	2157	72 30 18	2148
	α Pegasi W.	49 34 25	2677	51 11 36	2634	52 49 45	2596	54 28 46	2562
	Aldebaran E.	30 30 33	2123	28 40 8	2136	26 50 4	2154	25 0 27	2176
	Pollux E.	73 54 57	1981	72 0 53	1975	70 6 39	1970	68 12 17	1965
	Regulus E.	110 17 0	1996	108 23 19	1989	106 29 27	1983	104 35 26	1978
16	α Aquilæ W.	109 43 15	2927	111 15 0	2952	112 46 13	2981	114 16 49	3016
	Fomalhaut W.	81 40 39	2124	83 31 2	2123	85 21 26	2122	87 11 51	2123
	α Pegasi W.	62 53 59	2442	64 36 33	2426	66 19 30	2414	68 2 45	2404
	SATURN W.	22 13 21	1935	24 8 38	1935	26 3 55	1935	27 59 12	1936
	Pollux E.	58 39 0	1953	56 44 12	1954	54 49 26	1955	52 54 41	1957
	Regulus E.	95 3 45	1965	93 9 15	1965	91 14 46	1966	89 20 18	1968
17	Fomalhaut W.	96 22 49	2148	98 12 35	2157	100 2 9	2166	101 51 28	2176
	α Pegasi W.	76 41 43	2382	78 25 44	2383	80 9 43	2385	81 53 39	2389
	SATURN W.	37 34 36	1956	39 29 19	1963	41 23 52	1970	43 18 13	1978
	α Arietis W.	33 9 50	2246	34 57 8	2229	36 44 52	2215	38 32 57	2205
	Pollux E.	43 22 7	1980	41 28 1	1987	39 34 6	1995	37 40 24	2003
	Regulus E.	79 49 11	1990	77 55 21	1996	76 1 41	2004	74 8 13	2013
18	Fomalhaut W.	110 53 31	2247	112 40 49	2264	114 27 41	2283	116 14 5	2303
	α Pegasi W.	90 31 1	2435	92 13 46	2447	93 56 14	2461	95 38 22	2477
	SATURN W.	52 46 30	2028	54 39 20	2040	56 31 51	2053	58 24 2	2066
	α Arietis W.	47 35 40	2196	49 24 15	2200	51 12 43	2205	53 1 3	2212
	Pollux E.	28 15 40	2059	26 23 38	2073	24 31 58	2088	22 40 40	2103
	Regulus E.	64 44 34	2066	62 52 42	2079	61 1 10	2092	59 9 58	2106
19	α Pegasi W.	104 2 50	2577	105 42 17	2600	107 21 13	2624	108 59 35	2650
	SATURN W.	67 39 37	2140	69 29 35	2156	71 19 9	2172	73 8 18	2189
	α Arietis W.	61 59 34	2263	63 46 28	2276	65 33 2	2289	67 19 17	2304
	Aldebaran W.	31 33 5	2281	33 19 32	2286	35 5 52	2293	36 52 2	2302
	Regulus E.	49 59 42	2186	48 10 53	2203	46 22 30	2221	44 34 34	2240
	Spica E.	104 1 26	2173	102 12 18	2189	100 23 33	2205	98 35 13	2222
	JUPITER E.	112 55 27	2222	111 7 31	2238	109 20 0	2254	107 32 53	2271
20	SATURN W.	82 7 40	2277	83 54 14	2295	85 40 21	2313	87 26 1	2332
	α Arietis W.	76 5 4	2383	77 49 3	2400	79 32 38	2417	81 15 48	2434
	Aldebaran W.	45 39 5	2362	47 23 34	2377	49 7 42	2392	50 51 28	2408
	Regulus E.	35 42 9	2343	33 57 12	2365	32 12 47	2389	30 28 56	2414

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
20	Spica E.	96 47 17	2239	94 59 47	2256	93 12 43	2274	91 26 5	2291
	JUPITER E.	105 46 11	2289	103 59 55	2306	102 14 4	2324	100 28 39	2342
	SUN E.	131 12 41	2540	129 32 24	2559	127 52 33	2579	126 13 9	2598
21	SATURN W.	89 11 14	2350	90 56 0	2368	92 40 20	2387	94 24 14	2405
	α Arietis W.	82 58 34	2453	84 40 54	2471	86 22 48	2489	88 4 17	2507
	Aldebaran W.	52 34 52	2424	54 17 53	2440	56 0 31	2456	57 42 46	2473
	Regulus E.	28 45 41	2440	27 3 3	2467	25 21 3	2496	23 39 43	2527
	Spica E.	82 39 28	2383	80 55 29	2401	79 11 56	2420	77 28 50	2439
	JUPITER E.	91 48 12	2435	90 5 27	2453	88 23 8	2472	86 41 15	2491
	SUN E.	118 2 44	2696	116 25 59	2716	114 49 41	2736	113 13 50	2756
22	SATURN W.	102 57 7	2497	104 38 24	2515	106 19 16	2533	107 59 43	2551
	α Arietis W.	96 25 14	2601	98 4 8	2619	99 42 37	2638	101 20 40	2657
	Aldebaran W.	66 8 6	2558	67 47 59	2575	69 27 28	2592	71 6 34	2609
	Pollux W.	21 50 21	2535	23 30 46	2551	25 10 49	2567	26 50 30	2583
	Spica E.	68 59 58	2533	67 19 30	2551	65 39 28	2569	63 59 51	2587
	JUPITER E.	78 18 26	2584	76 39 9	2603	75 0 18	2621	73 21 51	2639
	SUN E.	105 21 5	2856	103 47 49	2876	102 14 59	2895	100 42 34	2914
23	Aldebaran W.	79 16 18	2692	80 53 8	2708	82 29 37	2724	84 5 45	2739
	Pollux W.	35 3 18	2664	36 40 46	2680	38 17 52	2695	39 54 38	2710
	Spica E.	55 47 52	2675	54 10 40	2692	52 33 50	2710	50 57 23	2727
	JUPITER E.	65 15 35	2725	63 39 29	2742	62 3 45	2758	60 28 22	2774
	SUN E.	93 6 27	3007	91 36 23	3025	90 6 41	3042	88 37 21	3059
24	Aldebaran W.	92 1 23	2814	93 35 33	2828	95 9 24	2842	96 42 58	2855
	Pollux W.	47 53 28	2784	49 23 17	2798	51 2 48	2811	52 37 2	2824
	Spica E.	43 0 39	2808	41 26 21	2824	39 52 24	2839	38 18 47	2855
	JUPITER E.	52 36 35	2849	51 3 12	2863	49 30 6	2877	47 57 18	2891
	SUN E.	81 15 47	3141	79 48 27	3156	78 21 25	3170	76 54 40	3184
25	Aldebaran W.	104 26 37	2917	105 58 34	2929	107 30 16	2940	109 1 44	2951
	Pollux W.	60 24 7	2884	61 56 46	2894	63 29 12	2905	65 1 24	2916
	Regulus W.	24 22 20	2965	25 53 17	2968	27 24 11	2971	28 55 0	2974
	Spica E.	30 35 41	2933	29 4 4	2950	27 32 48	2967	26 1 53	2985
	SUN E.	69 45 6	3251	68 19 57	3263	66 55 3	3275	65 30 22	3286
26	Pollux W.	72 39 19	2961	74 10 21	2969	75 41 12	2977	77 11 53	2985
	Regulus W.	36 27 44	3000	37 57 57	3005	39 28 4	3010	40 58 4	3016
	SUN E.	58 30 8	3337	57 6 39	3346	55 43 21	3355	54 20 13	3363
27	Pollux W.	84 43 10	3017	86 13 2	3022	87 42 47	3027	89 12 26	3032
	Regulus W.	48 26 27	3040	49 55 50	3045	51 25 7	3049	52 54 19	3054
	SUN E.	47 26 45	3399	46 4 27	3405	44 42 17	3411	43 20 13	3416
28	Pollux W.	96 39 18	3052	98 8 26	3055	99 37 31	3058	101 6 32	3061
	Regulus W.	60 19 14	3069	61 48 2	3072	63 16 46	3074	64 45 27	3076
	SUN E.	36 31 21	3440	35 9 50	3444	33 48 23	3448	32 27 0	3451
29	Regulus W.	72 8 18	3084	73 36 47	3086	75 5 14	3087	76 33 40	3087
	SUN E.	25 41 2	3466	24 20 0	3469	22 59 2	3472	21 38 6	3475



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
20	Spica	E.	89 39 52	2309	87 54 6	2328	86 8 47	2346	84 23 54	2364
	JUPITER	E.	98 43 40	2360	96 59 8	2379	95 15 3	2397	93 31 24	2416
	SUN	E.	124 34 11	2618	122 55 40	2637	121 17 35	2656	119 39 56	2676
21	SATURN	W.	96 7 41	2424	97 50 41	2442	99 33 16	2461	101 15 24	2479
	α Arietis	W.	89 45 20	2526	91 25 57	2545	93 6 8	2563	94 45 54	2582
	Aldebaran	W.	59 24 38	2490	61 6 5	2507	62 47 9	2524	64 27 49	2540
	Regulus	E.	21 59 7	2561	20 19 19	2601	18 40 26	2647	17 2 35	2699
	Spica	E.	75 46 11	2458	74 3 59	2476	72 22 12	2495	70 40 52	2514
	JUPITER	E.	84 59 49	2510	83 18 50	2528	81 38 16	2547	79 58 8	2566
	SUN	E.	111 38 24	2776	110 3 25	2796	108 28 53	2816	106 54 46	2836
22	SATURN	W.	109 39 46	2568	111 19 24	2585	112 58 39	2603	114 37 30	2620
	α Arietis	W.	102 58 18	2676	104 35 31	2695	106 12 18	2713	107 48 40	2731
	Aldebaran	W.	72 45 16	2626	74 23 35	2643	76 1 32	2660	77 39 6	2676
	Pollux	W.	28 29 48	2599	30 8 44	2616	31 47 17	2632	33 25 28	2648
	Spica	E.	62 20 38	2605	60 41 50	2623	59 3 27	2641	57 25 28	2658
	JUPITER	E.	71 43 48	2657	70 6 10	2674	68 28 55	2691	66 52 4	2708
	SUN	E.	99 10 33	2933	97 38 57	2952	96 7 44	2970	94 36 54	2989
23	Aldebaran	W.	85 41 33	2755	87 17 0	2770	88 52 7	2785	90 26 55	2800
	Pollux	W.	41 31 4	2726	43 7 9	2741	44 42 55	2756	46 18 21	2770
	Spica	E.	49 21 19	2744	47 45 37	2760	46 10 17	2776	44 35 18	2792
	JUPITER	E.	58 53 20	2799	57 18 39	2805	55 44 18	2821	54 10 17	2835
	SUN	E.	87 8 21	3076	85 39 42	3093	84 11 24	3109	82 43 26	3125
24	Aldebaran	W.	98 16 15	2868	99 49 15	2881	101 21 58	2893	102 54 25	2905
	Pollux	W.	54 10 59	2837	55 44 39	2849	57 18 4	2861	58 51 13	2872
	Spica	E.	36 45 30	2870	35 12 33	2885	33 39 55	2901	32 7 38	2917
	JUPITER	E.	46 24 48	2904	44 52 34	2916	43 20 36	2929	41 48 54	2941
	SUN	E.	75 28 13	3198	74 2 2	3212	72 36 8	3225	71 10 29	3238
25	Aldebaran	W.	110 32 58	2962	112 3 58	2973	113 34 45	2983	115 5 19	2992
	Pollux	W.	66 33 23	2926	68 5 9	2935	69 36 44	2944	71 8 7	2953
	Regulus	W.	30 25 45	2979	31 56 24	2984	33 26 57	2989	34 57 24	2994
	Spica	E.	24 31 20	3003	23 1 11	3023	21 31 27	3046	20 2 11	3070
	SUN	E.	64 5 55	3297	62 41 40	3308	61 17 38	3318	59 53 47	3328
26	Pollux	W.	78 42 25	2992	80 12 48	2998	81 43 3	3005	83 13 10	3011
	Regulus	W.	42 27 57	3021	43 57 44	3026	45 27 24	3031	46 56 58	3035
	SUN	E.	52 57 14	3371	51 34 24	3379	50 11 43	3386	48 49 10	3393
27	Pollux	W.	90 41 59	3037	92 11 26	3041	93 40 48	3045	95 10 5	3048
	Regulus	W.	54 23 27	3056	55 52 30	3060	57 21 28	3063	58 50 23	3066
	SUN	E.	41 58 15	3422	40 36 23	3427	39 14 37	3432	37 52 57	3436
28	Pollux	W.	102 35 29	3063	104 4 23	3065	105 33 15	3067	107 2 4	3069
	Regulus	W.	66 14 6	3078	67 42 42	3080	69 11 16	3082	70 39 48	3083
	SUN	E.	31 5 42	3454	29 44 27	3457	28 23 15	3460	27 2 7	3463
29	Regulus	W.	78 2 6	3087	79 30 31	3088	80 58 55	3087	82 27 20	3087
	SUN	E.	20 17 14	3479	18 56 26	3482	17 35 42	3484	16 15 0	3487

## AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sidereal Time of Semi-diameter Passing Meridian.	Equation of Time, to be Subtracted from		Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semi-diameter.	Added to Apparent Time				
Thur.	1	h m s 16 26 43.42	s 10.785	° ' " S. 21 43 18.6	" -23.97	' " 16 15.23	s 70.19	m s 11 6.00	s 0.925		
Frid.	2	16 31 2.58	10.812	21 52 41.7	22.92	16 15.39	70.28	10 43.47	0.952		
Sat.	3	16 35 22.37	10.837	22 1 39.4	21.86	16 15.54	70.37	10 20.30	0.978		
SUN.	4	16 39 42.77	10.862	22 10 11.6	-20.79	16 15.69	70.45	9 56.51	1.003		
Mon.	5	16 44 3.76	10.886	22 18 18.1	19.71	16 15.83	70.53	9 32.15	1.027		
Tues.	6	16 48 25.30	10.909	22 25 58.5	18.62	16 15.97	70.60	9 7.23	1.049		
Wed.	7	16 52 47.37	10.930	22 33 12.6	-17.52	16 16.11	70.67	8 41.78	1.070		
Thur.	8	16 57 9.94	10.950	22 40 0.2	16.42	16 16.24	70.74	8 15.85	1.090		
Frid.	9	17 1 32.97	10.969	22 46 21.0	15.30	16 16.37	70.81	7 49.45	1.109		
Sat.	10	17 5 56.44	10.987	22 52 14.8	-14.17	16 16.49	70.87	7 22.61	1.127		
SUN.	11	17 10 20.32	11.003	22 57 41.5	13.03	16 16.61	70.93	6 55.36	1.144		
Mon.	12	17 14 44.59	11.018	23 2 40.9	11.89	16 16.73	70.98	6 27.73	1.159		
Tues.	13	17 19 9.21	11.032	23 7 12.9	-10.74	16 16.84	71.03	5 59.75	1.173		
Wed.	14	17 23 34.14	11.045	23 11 17.4	9.59	16 16.94	71.07	5 31.44	1.185		
Thur.	15	17 27 59.37	11.056	23 14 54.2	8.43	16 17.03	71.11	5 2.84	1.197		
Frid.	16	17 32 24.87	11.067	23 18 3.1	-7.27	16 17.12	71.14	4 33.98	1.207		
Sat.	17	17 36 50.61	11.077	23 20 44.0	6.11	16 17.21	71.17	4 4.88	1.217		
SUN.	18	17 41 16.57	11.085	23 22 57.0	4.94	16 17.29	71.20	3 35.57	1.225		
Mon.	19	17 45 42.71	11.092	23 24 42.0	-3.77	16 17.36	71.22	3 6.06	1.232		
Tues.	20	17 50 9.01	11.098	23 25 58.8	2.60	16 17.42	71.24	2 36.40	1.238		
Wed.	21	17 54 35.44	11.103	23 26 47.4	1.43	16 17.48	71.25	2 6.61	1.242		
Thur.	22	17 59 1.96	11.106	23 27 7.7	-0.25	16 17.54	71.26	1 36.73	1.245		
Frid.	23	18 3 28.53	11.108	23 26 59.8	+0.93	16 17.59	71.26	1 6.80	1.247		
Sat.	24	18 7 55.13	11.108	23 26 23.6	2.11	16 17.63	71.26	0 36.85	1.247		
SUN.	25	18 12 21.73	11.107	23 25 19.1	+3.29	16 17.67	71.25	0 6.90	1.246		
Mon.	26	18 16 48.28	11.104	23 23 46.4	4.46	16 17.70	71.24	0 23.02	1.244		
Tues.	27	18 21 14.74	11.100	23 21 45.4	5.64	16 17.73	71.23	0 52.85	1.240		
Wed.	28	18 25 41.07	11.094	23 19 16.1	+6.82	16 17.76	71.21	1 22.55	1.234		
Thur.	29	18 30 7.25	11.087	23 16 18.6	7.99	16 17.78	71.18	1 52.09	1.226		
Frid.	30	18 34 33.25	11.078	23 12 53.2	9.15	16 17.80	71.15	2 21.44	1.217		
Sat.	31	18 38 59.02	11.068	23 8 59.9	10.31	16 17.81	71.11	2 50.56	1.207		
SUN.	32	18 43 24.51	11.056	S. 23 4 38.9	+11.46	16 17.82	71.07	3 19.41	1.196		

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 05.19 from the sidereal time. The sign - prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

## AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to		Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Subtracted from Mean Time.			
						h m s	s	° ' "	
Thur.	1	16 26 45.40	10.782	S. 21 43 23.0	- 23.96	11 5.83	0.925	16 37 51.23	
Frid.	2	16 31 4.50	10.809	21 52 45.7	22.91	10 43.29	0.952	16 41 47.79	
Sat.	3	16 35 24.23	10.835	22 1 43.1	21.85	10 20.12	0.978	16 45 44.35	
SUN.	4	16 39 44.56	10.859	22 10 15.1	- 20.78	9 56.35	1.003	16 49 40.91	
Mon.	5	16 44 5.47	10.883	22 18 21.2	19.70	9 31.99	1.027	16 53 37.46	
Tues.	6	16 48 26.94	10.906	22 26 1.3	18.61	9 7.08	1.049	16 57 34.02	
Wed.	7	16 52 48.94	10.927	22 33 15.1	- 17.52	8 41.64	1.070	17 1 30.58	
Thur.	8	16 57 11.44	10.947	22 40 2.4	16.41	8 15.70	1.090	17 5 27.14	
Frid.	9	17 1 34.40	10.966	22 46 22.9	15.29	7 49.30	1.109	17 9 23.70	
Sat.	10	17 5 57.79	10.983	22 52 16.5	- 14.16	7 22.47	1.127	17 13 20.26	
SUN.	11	17 10 21.59	11.000	22 57 43.0	13.03	6 55.22	1.144	17 17 16.81	
Mon.	12	17 14 45.77	11.015	23 2 42.3	11.89	6 27.60	1.159	17 21 13.37	
Tues.	13	17 19 10.30	11.029	23 7 14.1	- 10.74	5 59.63	1.173	17 25 9.93	
Wed.	14	17 23 35.15	11.042	23 11 18.3	9.59	5 31.34	1.185	17 29 6.49	
Thur.	15	17 28 0.29	11.053	23 14 54.8	8.43	5 2.76	1.197	17 33 3.05	
Frid.	16	17 32 25.70	11.064	23 18 3.5	- 7.27	4 33.91	1.207	17 36 59.61	
Sat.	17	17 36 51.35	11.074	23 20 44.4	6.11	4 4.82	1.217	17 40 56.17	
SUN.	18	17 41 17.22	11.082	23 22 57.3	4.95	3 35.51	1.225	17 44 52.73	
Mon.	19	17 45 43.27	11.089	23 24 42.2	- 3.78	3 6.01	1.232	17 48 49.28	
Tues.	20	17 50 9.48	11.095	23 25 58.9	2.60	2 36.36	1.238	17 52 45.84	
Wed.	21	17 54 35.82	11.100	23 26 47.4	1.42	2 6.58	1.242	17 56 42.40	
Thur.	22	17 59 2.25	11.103	23 27 7.7	- 0.25	1 36.71	1.245	18 0 38.96	
Frid.	23	18 3 28.73	11.104	23 26 59.8	+ 0.92	1 6.79	1.247	18 4 35.52	
Sat.	24	18 7 55.24	11.104	23 26 23.6	2.10	0 36.84	1.247	18 8 32.08	
SUN.	25	18 12 21.75	11.103	23 25 19.1	+ 3.28	0 6.89	1.246	18 12 28.64	
Mon.	26	18 16 48.20	11.100	23 23 46.4	4.46	0 23.00	1.244	18 16 25.20	
Tues.	27	18 21 14.56	11.096	23 21 45.5	5.63	0 52.81	1.240	18 20 21.75	
Wed.	28	18 25 40.81	11.090	23 19 16.3	+ 6.81	1 22.50	1.234	18 24 18.31	
Thur.	29	18 30 6.91	11.083	23 16 19.0	7.98	1 52.04	1.226	18 28 14.87	
Frid.	30	18 34 32.81	11.074	23 12 53.7	9.15	2 21.38	1.217	18 32 11.43	
Sat.	31	18 38 58.48	11.064	23 9 0.5	10.31	2 50.49	1.207	18 36 7.99	
SUN.	32	18 43 23.90	11.052	S. 23 4 39.5	+ 11.46	3 19.35	1.196	18 40 4.55	

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon.  
 The sign — prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour,  
 + 9<sup>s</sup>.8565.  
 (Table III.)

AT GREENWICH MEAN NOON.								
Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		TRUE LONGITUDE.		Diff. for 1 Hour.	LATITUDE.			
		$\lambda$	$\lambda'$					
1	335	248 26 13.3	25 40.9	152.14	— 0.07	9.993 8391	— 28.7	h m s 7 20 56.33
2	336	249 27 5.4	26 32.8	152.19	0.20	9.993 7710	28.1	7 17 0.42
3	337	250 27 58.6	27 25.8	152.24	0.31	9.993 7043	27.5	7 13 4.51
4	338	251 28 52.8	28 19.8	152.28	— 0.40	9.993 6390	— 26.9	7 9 8.60
5	339	252 29 47.9	29 14.7	152.32	0.48	9.993 5751	26.3	7 5 12.68
6	340	253 30 43.9	30 10.5	152.35	0.52	9.993 5127	25.6	7 1 16.77
7	341	254 31 40.7	31 7.1	152.38	— 0.53	9.993 4520	— 24.9	6 57 20.86
8	342	255 32 38.2	32 4.4	152.41	0.52	9.993 3930	24.2	6 53 24.95
9	343	256 33 36.3	33 2.3	152.43	0.47	9.993 3359	23.4	6 49 29.03
10	344	257 34 35.0	34 0.9	152.45	— 0.40	9.993 2808	— 22.5	6 45 33.12
11	345	258 35 34.3	35 0.0	152.48	0.30	9.993 2278	21.6	6 41 37.21
12	346	259 36 34.1	35 59.6	152.50	0.19	9.993 1771	20.6	6 37 41.30
13	347	260 37 34.5	36 59.7	152.52	— 0.04	9.993 1289	— 19.5	6 33 45.38
14	348	261 38 35.4	38 0.4	152.55	+ 0.10	9.993 0833	18.4	6 29 49.47
15	349	262 39 36.8	39 1.7	152.57	0.23	9.993 0404	17.3	6 25 53.56
16	350	263 40 38.8	40 3.6	152.60	+ 0.35	9.993 0003	— 16.1	6 21 57.64
17	351	264 41 41.5	41 6.1	152.63	0.45	9.992 9631	14.9	6 18 1.73
18	352	265 42 44.9	42 9.3	152.66	0.53	9.992 9287	13.7	6 14 5.82
19	353	266 43 49.1	43 13.2	152.69	+ 0.56	9.992 8971	— 12.6	6 10 9.91
20	354	267 44 54.0	44 17.9	152.72	0.58	9.992 8681	11.5	6 6 13.99
21	355	268 45 59.6	45 23.4	152.75	0.56	9.992 8417	10.5	6 2 18.08
22	356	269 47 6.0	46 29.6	152.78	+ 0.51	9.992 8178	— 9.5	5 58 22.17
23	357	270 48 13.2	47 36.5	152.81	0.44	9.992 7962	8.6	5 54 26.26
24	358	271 49 21.0	48 44.1	152.84	0.34	9.992 7767	7.7	5 50 30.34
25	359	272 50 29.4	49 52.4	152.86	+ 0.22	9.992 7594	— 6.8	5 46 34.43
26	360	273 51 38.4	51 1.1	152.88	+ 0.09	9.992 7441	6.0	5 42 38.51
27	361	274 52 47.9	52 10.4	152.90	— 0.04	9.992 7307	5.2	5 38 42.60
28	362	275 53 57.8	53 20.1	152.92	— 0.17	9.992 7192	— 4.4	5 34 46.69
29	363	276 55 8.1	54 30.2	152.93	0.29	9.992 7095	3.7	5 30 50.78
30	364	277 56 18.6	55 40.6	152.94	0.40	9.992 7016	3.0	5 26 54.86
31	365	278 57 29.3	56 51.1	152.95	0.49	9.992 6954	2.2	5 22 58.95
32	366	279 58 40.2	58 1.7	152.95	— 0.56	9.992 6908	— 1.5	5 19 3.04
NOTE.—The numbers in column $\lambda$ correspond to the true equinox of the date; in column $\lambda'$ to the mean equinox of January 0 <sup>d</sup> .								Diff. for 1 Hour, — 9 <sup>s</sup> .8296. (Table II.)

## GREENWICH MEAN TIME.

## THE MOON'S

Day of the Month.

## SEMIDIAMETER.

## HORIZONTAL PARALLAX.

## UPPER TRANSIT.

## AGE.

Noon.

Midnight.

Noon.

Diff. for  
1 Hour.

Midnight.

Diff. for  
1 Hour.Meridian of  
Greenwich.Diff. for  
1 Hour.

Noon.

	"	"	"	"	"	"	h m	m	d
1	14 43.8	14 44.4	53 57.6	+ 0.15	54 0.0	+ 0.25	0	.	29.4
2	14 45.4	14 46.8	54 3.7	0.36	54 8.6	0.46	0	17.4	0.6
3	14 48.5	14 50.5	54 14.8	0.57	54 22.2	0.67	1	7.8	1.6
4	14 52.8	14 55.6	54 30.9	+ 0.79	54 41.0	+ 0.90	1	59.5	2.6
5	14 58.7	15 2.3	54 52.5	1.03	55 5.6	1.15	2	51.5	3.6
6	15 6.3	15 10.7	55 20.1	1.28	55 36.3	1.41	3	42.6	4.6
7	15 15.5	15 20.8	55 54.0	+ 1.55	56 13.4	+ 1.68	4	32.1	5.6
8	15 26.5	15 32.6	56 34.3	1.80	56 56.7	1.92	5	19.9	6.6
9	15 39.0	15 45.7	57 20.3	2.02	57 45.0	2.10	6	6.5	7.6
10	15 52.7	15 59.8	58 10.6	+ 2.15	58 36.5	+ 2.16	6	52.9	8.6
11	16 6.8	16 13.7	59 2.3	2.14	59 27.6	2.06	7	40.2	9.6
12	16 20.2	16 26.3	59 51.7	1.93	60 14.0	1.75	8	29.8	10.6
13	16 31.7	16 36.2	60 33.7	+ 1.52	60 50.3	+ 1.23	9	23.2	11.6
14	16 39.7	16 42.1	61 3.2	0.89	61 11.7	+ 0.52	10	21.3	12.6
15	16 43.1	16 42.8	61 15.5	+ 0.12	61 14.5	- 0.30	11	24.3	13.6
16	16 41.2	16 38.3	61 8.6	- 0.70	60 57.8	- 1.09	12	30.3	14.6
17	16 34.1	16 28.9	60 42.6	1.44	60 23.3	1.75	13	36.1	15.6
18	16 22.7	16 15.8	60 0.6	2.00	59 35.3	2.20	14	38.5	16.6
19	16 8.3	16 0.5	59 7.9	- 2.33	58 39.3	- 2.41	15	35.5	17.6
20	15 52.6	15 44.6	58 10.1	2.43	57 40.9	2.41	16	26.8	18.6
21	15 36.8	15 29.4	57 12.4	2.33	56 45.0	2.23	17	13.4	19.6
22	15 22.3	15 15.8	56 19.1	- 2.08	55 55.0	- 1.92	17	56.6	20.6
23	15 9.8	15 4.4	55 33.1	1.74	55 13.4	1.54	18	37.8	21.6
24	14 59.7	14 55.6	54 56.0	1.35	54 41.1	1.15	19	18.2	22.6
25	14 52.3	14 49.5	54 28.7	- 0.94	54 18.6	- 0.74	19	59.1	23.6
26	14 47.4	14 45.9	54 10.9	0.55	54 5.4	0.37	20	41.4	24.6
27	14 45.0	14 44.6	54 2.1	- 0.19	54 0.8	- 0.02	21	25.9	25.6
28	14 44.8	14 45.4	54 1.3	+ 0.12	54 3.6	+ 0.25	22	13.2	26.6
29	14 46.5	14 47.9	54 7.4	0.38	54 12.7	0.50	23	3.0	27.6
30	14 49.7	14 51.8	54 19.2	0.60	54 26.9	0.69	23	54.8	28.6
31	14 54.2	14 56.8	54 35.7	0.77	54 45.4	0.85	6	.	29.6
32	14 59.7	15 2.8	54 55.9	+ 0.92	55 7.3	+ 0.98	0	47.3	0.8

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
THURSDAY 1.					SATURDAY 3.				
0	16 8 11.14	2.0538	S. 22 21 43.4	8.082	0	17 51 11.73	2.2233	S. 26 44 10.4	2.586
1	16 10 14.49	2.0579	22 29 45.4	7.984	1	17 53 25.20	2.2257	26 46 41.7	2.457
2	16 12 18.09	2.0621	22 37 41.5	7.887	2	17 55 38.81	2.2279	26 49 5.2	2.327
3	16 14 21.94	2.0663	22 45 31.8	7.788	3	17 57 52.55	2.2301	26 51 20.9	2.196
4	16 16 26.04	2.0704	22 53 16.1	7.689	4	18 0 6.42	2.2322	26 53 28.7	2.064
5	16 18 30.39	2.0746	23 0 54.5	7.589	5	18 2 20.41	2.2342	26 55 28.6	1.933
6	16 20 34.99	2.0788	23 8 26.8	7.488	6	18 4 34.52	2.2362	26 57 20.7	1.802
7	16 22 39.84	2.0828	23 15 53.0	7.387	7	18 6 48.75	2.2380	26 59 4.9	1.670
8	16 24 44.93	2.0870	23 23 13.2	7.284	8	18 9 3.08	2.2398	27 0 41.1	1.538
9	16 26 50.28	2.0912	23 30 27.1	7.180	9	18 11 17.52	2.2415	27 2 9.4	1.406
10	16 28 55.87	2.0952	23 37 34.8	7.076	10	18 13 32.06	2.2431	27 3 29.8	1.273
11	16 31 1.70	2.0993	23 44 36.2	6.971	11	18 15 46.69	2.2447	27 4 42.1	1.138
12	16 33 7.78	2.1033	23 51 31.3	6.865	12	18 18 1.42	2.2462	27 5 46.4	1.005
13	16 35 14.10	2.1073	23 58 20.0	6.758	13	18 20 16.23	2.2476	27 6 42.7	0.872
14	16 37 20.66	2.1113	24 5 2.3	6.652	14	18 22 31.13	2.2489	27 7 31.0	0.738
15	16 39 27.46	2.1153	24 11 38.2	6.543	15	18 24 46.10	2.2502	27 8 11.2	0.603
16	16 41 34.50	2.1193	24 18 7.5	6.434	16	18 27 1.15	2.2514	27 8 43.3	0.468
17	16 43 41.78	2.1233	24 24 30.3	6.324	17	18 29 16.27	2.2524	27 9 7.3	0.333
18	16 45 49.29	2.1271	24 30 46.4	6.213	18	18 31 31.44	2.2533	27 9 23.3	0.199
19	16 47 57.03	2.1310	24 36 55.9	6.103	19	18 33 46.67	2.2543	27 9 31.2	-0.063
20	16 50 5.01	2.1348	24 42 58.7	5.990	20	18 36 1.96	2.2553	27 9 30.9	+0.072
21	16 52 13.21	2.1386	24 48 54.7	5.878	21	18 38 17.30	2.2560	27 9 22.5	0.207
22	16 54 21.64	2.1424	24 54 44.0	5.764	22	18 40 32.68	2.2567	27 9 6.0	0.343
23	16 56 30.30	2.1462	S. 25 0 26.4	5.650	23	18 42 48.10	2.2573	S. 27 8 41.4	0.478
FRIDAY 2.					SUNDAY 4.				
0	16 58 39.18	2.1498	S. 25 6 2.0	5.536	0	18 45 3.56	2.2578	S. 27 8 8.6	0.614
1	17 0 48.28	2.1535	25 11 30.7	5.420	1	18 47 19.04	2.2583	27 7 27.7	0.750
2	17 2 57.60	2.1571	25 16 52.4	5.303	2	18 49 34.55	2.2587	27 6 38.6	0.887
3	17 5 7.13	2.1607	25 22 7.1	5.186	3	18 51 50.08	2.2589	27 5 41.3	1.023
4	17 7 16.88	2.1642	25 27 14.7	5.068	4	18 54 5.62	2.2592	27 4 35.9	1.158
5	17 9 26.83	2.1676	25 32 15.3	4.950	5	18 56 21.18	2.2593	27 3 22.3	1.295
6	17 11 36.99	2.1711	25 37 8.7	4.831	6	18 58 36.74	2.2593	27 2 0.5	1.431
7	17 13 47.36	2.1745	25 41 55.0	4.711	7	19 0 52.30	2.2593	27 0 30.6	1.567
8	17 15 57.93	2.1778	25 46 34.0	4.591	8	19 3 7.86	2.2593	26 58 52.5	1.703
9	17 18 8.70	2.1811	25 51 5.9	4.471	9	19 5 23.41	2.2591	26 57 6.3	1.838
10	17 20 19.66	2.1843	25 55 30.5	4.348	10	19 7 38.95	2.2588	26 55 11.9	1.974
11	17 22 30.81	2.1874	25 59 47.7	4.226	11	19 9 54.47	2.2584	26 53 9.4	2.109
12	17 24 42.15	2.1906	26 3 57.6	4.103	12	19 12 9.96	2.2580	26 50 58.8	2.245
13	17 26 53.68	2.1937	26 8 0.1	3.980	13	19 14 25.43	2.2576	26 48 40.0	2.381
14	17 29 5.39	2.1967	26 11 55.2	3.856	14	19 16 40.87	2.2570	26 46 13.1	2.517
15	17 31 17.28	2.1996	26 15 42.8	3.731	15	19 18 56.27	2.2563	26 43 38.0	2.653
16	17 33 29.34	2.2025	26 19 22.9	3.606	16	19 21 11.63	2.2556	26 40 54.8	2.788
17	17 35 41.58	2.2054	26 22 55.5	3.481	17	19 23 26.94	2.2548	26 38 3.5	2.923
18	17 37 53.99	2.2082	26 26 20.6	3.355	18	19 25 42.21	2.2540	26 35 4.1	3.058
19	17 40 6.56	2.2108	26 29 38.1	3.228	19	19 27 57.42	2.2531	26 31 56.6	3.192
20	17 42 19.29	2.2134	26 32 47.9	3.100	20	19 30 12.58	2.2521	26 28 41.1	3.326
21	17 44 32.17	2.2160	26 35 50.1	2.973	21	19 32 27.67	2.2510	26 25 17.5	3.461
22	17 46 45.21	2.2186	26 38 44.6	2.844	22	19 34 42.70	2.2499	26 21 45.8	3.595
23	17 48 58.40	2.2210	26 41 31.4	2.715	23	19 36 57.66	2.2488	26 18 6.1	3.728
24	17 51 11.73	2.2233	S. 26 44 10.4	2.586	24	19 39 12.55	2.2475	S. 26 14 18.4	3.862

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
MONDAY 5.					WEDNESDAY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 39 12.55	2.2475	S. 26 14 18.4	3.862	0	21 24 41.64	2.1360	S. 20 43 18.1	9.718
1	19 41 27.36	2.2461	26 10 22.7	3.995	1	21 26 49.72	2.1333	20 33 31.8	9.825
2	19 43 42.08	2.2447	26 6 19.0	4.128	2	21 28 57.63	2.1304	20 23 39.1	9.931
3	19 45 56.72	2.2433	26 2 7.4	4.260	3	21 31 5.37	2.1277	20 13 40.1	10.036
4	19 48 11.27	2.2418	25 57 47.8	4.393	4	21 33 12.95	2.1250	20 3 34.8	10.141
5	19 50 25.73	2.2402	25 53 20.3	4.524	5	21 35 20.37	2.1223	19 53 23.2	10.245
6	19 52 40.09	2.2386	25 48 44.9	4.656	6	21 37 27.63	2.1197	19 43 5.4	10.348
7	19 54 54.36	2.2369	25 44 1.6	4.787	7	21 39 34.73	2.1170	19 32 41.4	10.451
8	19 57 8.52	2.2351	25 39 10.5	4.918	8	21 41 41.67	2.1143	19 22 11.3	10.552
9	19 59 22.57	2.2333	25 34 11.5	5.048	9	21 43 48.45	2.1117	19 11 35.2	10.653
10	20 1 36.51	2.2314	25 29 4.7	5.178	10	21 45 55.07	2.1091	19 0 53.0	10.753
11	20 3 50.34	2.2295	25 23 50.1	5.308	11	21 48 1.54	2.1065	18 50 4.9	10.852
12	20 6 4.05	2.2275	25 18 27.8	5.437	12	21 50 7.85	2.1039	18 39 10.8	10.951
13	20 8 17.64	2.2255	25 12 57.7	5.566	13	21 52 14.01	2.1013	18 28 10.8	11.048
14	20 10 31.11	2.2235	25 7 19.9	5.694	14	21 54 20.01	2.0988	18 17 5.0	11.145
15	20 12 44.46	2.2214	25 1 34.4	5.822	15	21 56 25.87	2.0964	18 5 53.4	11.241
16	20 14 57.68	2.2193	24 55 41.3	5.948	16	21 58 31.58	2.0939	17 54 36.1	11.337
17	20 17 10.77	2.2170	24 49 40.6	6.076	17	22 0 37.14	2.0915	17 43 13.0	11.432
18	20 19 23.72	2.2148	24 43 32.2	6.203	18	22 2 42.56	2.0891	17 31 44.3	11.525
19	20 21 36.54	2.2125	24 37 16.3	6.328	19	22 4 47.83	2.0867	17 20 10.0	11.618
20	20 23 49.22	2.2102	24 30 52.9	6.453	20	22 6 52.96	2.0843	17 8 30.1	11.711
21	20 26 1.76	2.2078	24 24 21.9	6.578	21	22 8 57.95	2.0821	16 56 44.7	11.802
22	20 28 14.16	2.2054	24 17 43.5	6.703	22	22 11 2.81	2.0798	16 44 53.9	11.892
23	20 30 26.41	2.2030	S. 24 10 57.6	6.827	23	22 13 7.53	2.0776	S. 16 32 57.7	11.982
TUESDAY 6.					THURSDAY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 32 38.52	2.2006	S. 24 4 4.3	6.949	0	22 15 12.12	2.0754	S. 16 20 56.1	12.071
1	20 34 50.48	2.1981	23 57 3.7	7.072	1	22 17 16.58	2.0733	16 8 49.2	12.158
2	20 37 2.29	2.1956	23 49 55.7	7.194	2	22 19 20.91	2.0712	15 56 37.1	12.246
3	20 39 13.95	2.1930	23 42 40.4	7.316	3	22 21 25.12	2.0691	15 44 19.7	12.333
4	20 41 25.45	2.1904	23 35 17.8	7.437	4	22 23 29.20	2.0671	15 31 57.2	12.418
5	20 43 36.80	2.1878	23 27 48.0	7.557	5	22 25 33.17	2.0652	15 19 29.5	12.503
6	20 45 47.99	2.1852	23 20 11.0	7.677	6	22 27 37.02	2.0633	15 6 56.8	12.587
7	20 47 59.02	2.1826	23 12 26.8	7.796	7	22 29 40.76	2.0613	14 54 19.1	12.669
8	20 50 9.90	2.1800	23 4 35.5	7.914	8	22 31 44.38	2.0594	14 41 36.5	12.752
9	20 52 20.62	2.1773	22 56 37.1	8.032	9	22 33 47.89	2.0577	14 28 48.9	12.833
10	20 54 31.17	2.1745	22 48 31.7	8.148	10	22 35 51.30	2.0560	14 15 56.5	12.914
11	20 56 41.56	2.1718	22 40 19.3	8.265	11	22 37 54.61	2.0543	14 2 59.2	12.994
12	20 58 51.79	2.1692	22 31 59.9	8.381	12	22 39 57.82	2.0528	13 49 57.2	13.073
13	21 1 1.86	2.1664	22 23 33.6	8.496	13	22 42 0.94	2.0512	13 36 50.5	13.150
14	21 3 11.76	2.1636	22 15 0.4	8.611	14	22 44 3.96	2.0496	13 23 39.2	13.227
15	21 5 21.49	2.1608	22 6 20.3	8.725	15	22 46 6.89	2.0482	13 10 23.3	13.303
16	21 7 31.06	2.1581	21 57 33.4	8.838	16	22 48 9.74	2.0468	12 57 2.8	13.379
17	21 9 40.46	2.1553	21 48 39.7	8.951	17	22 50 12.50	2.0453	12 43 37.8	13.454
18	21 11 49.70	2.1526	21 39 39.3	9.063	18	22 52 15.18	2.0441	12 30 8.3	13.528
19	21 13 58.77	2.1498	21 30 32.2	9.173	19	22 54 17.79	2.0429	12 16 34.5	13.600
20	21 16 7.68	2.1471	21 21 18.5	9.283	20	22 56 20.33	2.0418	12 2 56.3	13.672
21	21 18 16.42	2.1443	21 11 58.2	9.393	21	22 58 22.80	2.0406	11 49 13.9	13.743
22	21 20 24.99	2.1415	21 2 31.3	9.502	22	23 0 25.20	2.0396	11 35 27.2	13.813
23	21 22 33.40	2.1388	20 52 57.9	9.610	23	23 2 27.55	2.0387	11 21 36.4	13.882
24	21 24 41.64	2.1360	S. 20 43 18.1	9.718	24	23 4 29.84	2.0378	S. 11 7 41.4	13.950

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
FRIDAY 9..					SUNDAY 11.				
0	h m s		° ' "	"	0	h m s		° ' "	"
0	23 4 29.84	2.0378	S. 11 7 41.4	13.950	0	0 42 38.86	2.0830	N. 1 1 36.1	16.019
1	23 6 32.08	2.0369	10 53 42.4	14.018	1	0 44 43.93	2.0860	1 17 37.7	16.033
2	23 8 34.27	2.0361	10 39 39.3	14.084	2	0 46 49.18	2.0891	1 33 40.1	16.046
3	23 10 36.41	2.0353	10 25 32.3	14.149	3	0 48 54.62	2.0923	1 49 43.2	16.058
4	23 12 38.51	2.0347	10 11 21.4	14.213	4	0 51 0.26	2.0957	2 5 47.0	16.068
5	23 14 40.57	2.0341	9 57 6.7	14.277	5	0 53 6.10	2.0990	2 21 51.4	16.077
6	23 16 42.60	2.0336	9 42 48.2	14.339	6	0 55 12.14	2.1025	2 37 56.2	16.083
7	23 18 44.60	2.0332	9 28 26.0	14.401	7	0 57 18.40	2.1061	2 54 1.4	16.090
8	23 20 46.58	2.0328	9 14 0.1	14.462	8	0 59 24.87	2.1097	3 10 7.0	16.095
9	23 22 48.54	2.0325	8 59 30.6	14.522	9	1 1 31.56	2.1134	3 26 12.8	16.098
10	23 24 50.48	2.0323	8 44 57.5	14.580	10	1 3 38.48	2.1173	3 42 18.7	16.098
11	23 26 52.41	2.0322	8 30 21.0	14.638	11	1 5 45.64	2.1213	3 58 24.6	16.098
12	23 28 54.34	2.0321	8 15 41.0	14.695	12	1 7 53.04	2.1253	4 14 30.5	16.098
13	23 30 56.26	2.0320	8 0 57.6	14.751	13	1 10 0.68	2.1294	4 30 36.3	16.095
14	23 32 58.18	2.0321	7 46 10.9	14.805	14	1 12 8.57	2.1336	4 46 41.9	16.090
15	23 35 0.11	2.0323	7 31 21.0	14.859	15	1 14 16.71	2.1379	5 2 47.1	16.083
16	23 37 2.05	2.0325	7 16 27.8	14.912	16	1 16 25.12	2.1423	5 18 51.9	16.076
17	23 39 4.01	2.0328	7 1 31.5	14.965	17	1 18 33.79	2.1468	5 34 56.2	16.067
18	23 41 5.98	2.0331	6 46 32.2	15.014	18	1 20 42.74	2.1514	5 50 59.9	16.056
19	23 43 7.98	2.0336	6 31 29.8	15.064	19	1 22 51.96	2.1561	6 7 2.9	16.043
20	23 45 10.01	2.0341	6 16 24.5	15.113	20	1 25 1.47	2.1609	6 23 5.1	16.028
21	23 47 12.07	2.0347	6 1 16.3	15.161	21	1 27 11.27	2.1658	6 39 6.3	16.013
22	23 49 14.17	2.0353	5 46 5.2	15.208	22	1 29 21.36	2.1707	6 55 6.6	15.996
23	23 51 16.31	2.0362	S. 5 30 51.3	15.253	23	1 31 31.75	2.1757	N. 7 11 5.8	15.977
SATURDAY 10.					MONDAY 12.				
0	23 53 18.51	2.0371	S. 5 15 34.8	15.298	0	1 33 42.44	2.1808	N. 7 27 3.8	15.956
1	23 55 20.76	2.0379	5 0 15.6	15.341	1	1 35 53.44	2.1860	7 43 0.5	15.933
2	23 57 23.06	2.0389	4 44 53.9	15.383	2	1 38 4.76	2.1913	7 58 55.8	15.909
3	23 59 25.43	2.0401	4 29 29.7	15.424	3	1 40 16.40	2.1968	8 14 49.6	15.883
4	0 1 27.87	2.0413	4 14 3.0	15.464	4	1 42 28.37	2.2022	8 30 41.7	15.854
5	0 3 30.38	2.0425	3 58 34.0	15.503	5	1 44 40.66	2.2077	8 46 32.1	15.825
6	0 5 32.97	2.0438	3 43 2.6	15.542	6	1 46 53.29	2.2134	9 2 20.7	15.793
7	0 7 35.64	2.0453	3 27 29.0	15.578	7	1 49 6.27	2.2192	9 18 7.3	15.760
8	0 9 38.40	2.0468	3 11 53.3	15.613	8	1 51 19.59	2.2249	9 33 51.9	15.725
9	0 11 41.25	2.0483	2 56 15.4	15.648	9	1 53 33.26	2.2308	9 49 34.3	15.688
10	0 13 44.20	2.0501	2 40 35.5	15.682	10	1 55 47.29	2.2368	10 5 14.5	15.650
11	0 15 47.26	2.0519	2 24 53.6	15.714	11	1 58 1.67	2.2428	10 20 52.3	15.608
12	0 17 50.43	2.0538	2 9 9.8	15.745	12	2 0 16.43	2.2491	10 36 27.5	15.565
13	0 19 53.71	2.0557	1 53 24.2	15.774	13	2 2 31.56	2.2553	10 52 0.1	15.521
14	0 21 57.11	2.0578	1 37 36.9	15.803	14	2 4 47.06	2.2615	11 7 30.0	15.474
15	0 24 0.64	2.0599	1 21 47.9	15.830	15	2 7 2.94	2.2678	11 22 57.0	15.426
16	0 26 4.30	2.0621	1 5 57.3	15.856	16	2 9 19.20	2.2743	11 38 21.1	15.376
17	0 28 8.09	2.0643	0 50 5.2	15.881	17	2 11 35.85	2.2808	11 53 42.1	15.323
18	0 30 12.02	2.0668	0 34 11.6	15.904	18	2 13 52.90	2.2875	12 8 59.8	15.268
19	0 32 16.10	2.0693	0 18 16.7	15.927	19	2 16 10.35	2.2942	12 24 14.2	15.211
20	0 34 20.33	2.0718	S. 0 2 20.4	15.948	20	2 18 28.20	2.3008	12 39 25.1	15.153
21	0 36 24.71	2.0744	N. 0 13 37.1	15.968	21	2 20 46.45	2.3077	12 54 32.5	15.092
22	0 38 29.26	2.0772	0 29 35.7	15.986	22	2 23 5.12	2.3146	13 9 36.1	15.028
23	0 40 33.97	2.0800	0 45 35.4	16.003	23	2 25 24.20	2.3214	13 24 35.9	14.964
24	0 42 38.86	2.0830	N. 1 1 36.1	16.019	24	2 27 43.69	2.3284	N. 13 39 31.8	14.898



## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
TUESDAY 13.					THURSDAY 15.				
0	2 27 43.69	2.3284	N.13 39 31.8	14.898	0	4 28 10.11	2.6863	N.23 35 33.6	9.086
1	2 30 3.61	2.3356	13 54 23.6	14.828	1	4 30 51.49	2.6928	23 44 33.6	8.913
2	2 32 23.96	2.3427	14 9 11.2	14.757	2	4 33 33.25	2.6991	23 53 23.1	8.737
3	2 34 44.73	2.3498	14 23 54.4	14.683	3	4 36 15.38	2.7053	24 2 2.0	8.559
4	2 37 5.94	2.3571	14 38 33.2	14.608	4	4 38 57.88	2.7113	24 10 30.2	8.381
5	2 39 27.58	2.3644	14 53 7.4	14.530	5	4 41 40.74	2.7172	24 18 47.7	8.200
6	2 41 49.67	2.3718	15 7 36.8	14.450	6	4 44 23.94	2.7229	24 26 54.2	8.017
7	2 44 12.19	2.3791	15 22 1.4	14.368	7	4 47 7.49	2.7287	24 34 49.7	7.833
8	2 46 35.16	2.3866	15 36 21.0	14.284	8	4 49 51.38	2.7342	24 42 34.2	7.648
9	2 48 58.58	2.3941	15 50 35.5	14.198	9	4 52 35.59	2.7395	24 50 7.5	7.461
10	2 51 22.45	2.4016	16 4 44.7	14.109	10	4 55 20.12	2.7448	24 57 29.5	7.272
11	2 53 46.77	2.4092	16 18 48.6	14.018	11	4 58 4.96	2.7498	25 4 40.1	7.081
12	2 56 11.55	2.4168	16 32 46.9	13.925	12	5 0 50.09	2.7546	25 11 39.2	6.889
13	2 58 36.79	2.4244	16 46 39.6	13.830	13	5 3 35.51	2.7593	25 18 26.8	6.696
14	3 1 2.48	2.4321	17 0 26.5	13.733	14	5 6 21.21	2.7639	25 25 2.7	6.501
15	3 3 28.64	2.4398	17 14 7.5	13.633	15	5 9 7.18	2.7683	25 31 26.9	6.305
16	3 5 55.26	2.4475	17 27 42.4	13.531	16	5 11 53.41	2.7725	25 37 39.3	6.108
17	3 8 22.34	2.4552	17 41 11.2	13.427	17	5 14 39.88	2.7765	25 43 39.9	5.910
18	3 10 49.89	2.4631	17 54 33.6	13.319	18	5 17 26.59	2.7803	25 49 28.5	5.710
19	3 13 17.91	2.4708	18 7 49.5	13.210	19	5 20 13.52	2.7839	25 55 5.1	5.510
20	3 15 46.39	2.4786	18 20 58.8	13.099	20	5 23 0.66	2.7874	26 0 29.7	5.308
21	3 18 15.34	2.4864	18 34 1.4	12.986	21	5 25 48.01	2.7907	26 5 42.1	5.105
22	3 20 44.76	2.4942	18 46 57.1	12.870	22	5 28 35.54	2.7937	26 10 42.3	4.902
23	3 23 14.64	2.5020	N.18 59 45.8	12.753	23	5 31 23.25	2.7966	N.26 15 30.3	4.697
WEDNESDAY 14.					FRIDAY 16.				
0	3 25 45.00	2.5099	N.19 12 27.4	12.633	0	5 34 11.13	2.7993	N.26 20 5.9	4.491
1	3 28 15.83	2.5177	19 25 1.7	12.510	1	5 36 59.16	2.8018	26 24 29.2	4.285
2	3 30 47.12	2.5254	19 37 28.6	12.386	2	5 39 47.34	2.8040	26 28 40.1	4.078
3	3 33 18.88	2.5333	19 49 48.0	12.258	3	5 42 35.64	2.8059	26 32 38.5	3.870
4	3 35 51.11	2.5411	20 1 59.6	12.128	4	5 45 24.05	2.8077	26 36 24.5	3.662
5	3 38 23.81	2.5488	20 14 3.4	11.997	5	5 48 12.57	2.8093	26 39 57.9	3.453
6	3 40 56.97	2.5565	20 25 59.3	11.863	6	5 51 1.17	2.8107	26 43 18.8	3.244
7	3 43 30.59	2.5642	20 37 47.0	11.727	7	5 53 49.85	2.8118	26 46 27.2	3.034
8	3 46 4.67	2.5718	20 49 26.5	11.589	8	5 56 38.59	2.8128	26 49 22.9	2.823
9	3 48 39.21	2.5794	21 0 57.7	11.449	9	5 59 27.38	2.8135	26 52 6.0	2.613
10	3 51 14.20	2.5870	21 12 20.4	11.306	10	6 2 16.21	2.8140	26 54 36.5	2.403
11	3 53 49.65	2.5946	21 23 34.4	11.161	11	6 5 5.06	2.8143	26 56 54.3	2.192
12	3 56 25.55	2.6021	21 34 39.7	11.014	12	6 7 53.92	2.8143	26 58 59.5	1.981
13	3 59 1.90	2.6095	21 45 36.1	10.865	13	6 10 42.78	2.8142	27 0 52.0	1.769
14	4 1 38.69	2.6169	21 56 23.5	10.713	14	6 13 31.62	2.8137	27 2 31.8	1.558
15	4 4 15.93	2.6243	22 7 1.7	10.560	15	6 16 20.42	2.8130	27 3 58.9	1.347
16	4 6 53.60	2.6314	22 17 30.7	10.405	16	6 19 9.18	2.8122	27 5 13.4	1.136
17	4 9 31.70	2.6386	22 27 50.3	10.247	17	6 21 57.88	2.8110	27 6 15.2	0.925
18	4 12 10.23	2.6457	22 38 0.3	10.087	18	6 24 46.50	2.8097	27 7 4.4	0.715
19	4 14 49.18	2.6528	22 48 0.7	9.925	19	6 27 35.04	2.8082	27 7 41.0	0.505
20	4 17 28.56	2.6598	22 57 51.3	9.761	20	6 30 23.48	2.8063	27 8 5.0	0.295
21	4 20 8.35	2.6665	23 7 32.0	9.595	21	6 33 11.80	2.8043	27 8 16.4	0.086
22	4 22 48.54	2.6732	23 17 2.7	9.428	22	6 36 0.00	2.8022	27 8 15.3	-0.123
23	4 25 29.13	2.6798	23 26 23.3	9.258	23	6 38 48.06	2.7998	27 8 1.6	0.333
24	4 28 10.11	2.6863	N.23 35 33.6	9.086	24	6 41 35.97	2.7971	N.27 7 35.4	0.541

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SATURDAY 17.					MONDAY 19.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	6 41 35.97	2.7971	N.27 7 35.4	0.541	0	8 49 21.61	2.4761	N.23 4 32.4	8.965
1	6 44 23.71	2.7942	27 6 56.8	0.748	1	8 51 49.90	2.4671	22 55 30.5	9.097
2	6 47 11.27	2.7911	27 6 5.7	0.955	2	8 54 17.66	2.4582	22 46 20.8	9.226
3	6 49 58.64	2.7878	27 5 2.2	1.161	3	8 56 44.88	2.4491	22 37 3.4	9.353
4	6 52 45.80	2.7843	27 3 46.4	1.365	4	8 59 11.55	2.4400	22 27 38.4	9.478
5	6 55 32.75	2.7806	27 2 18.4	1.569	5	9 1 37.68	2.4310	22 18 6.0	9.602
6	6 58 19.47	2.7766	27 0 38.1	1.773	6	9 4 3.27	2.4219	22 8 26.2	9.723
7	7 1 5.94	2.7724	26 58 45.7	1.974	7	9 6 28.31	2.4129	21 58 39.2	9.843
8	7 3 52.16	2.7682	26 56 41.2	2.176	8	9 8 52.82	2.4039	21 48 45.1	9.959
9	7 6 38.12	2.7636	26 54 24.6	2.377	9	9 11 16.78	2.3948	21 38 44.1	10.074
10	7 9 23.79	2.7588	26 51 56.0	2.576	10	9 13 40.20	2.3858	21 28 36.2	10.188
11	7 12 9.18	2.7540	26 49 15.5	2.773	11	9 16 3.07	2.3768	21 18 21.5	10.300
12	7 14 54.27	2.7488	26 46 23.2	2.970	12	9 18 25.41	2.3678	21 8 0.2	10.409
13	7 17 39.04	2.7435	26 43 19.1	3.166	13	9 20 47.21	2.3588	20 57 32.4	10.517
14	7 20 23.49	2.7380	26 40 3.3	3.360	14	9 23 8.47	2.3498	20 46 58.2	10.622
15	7 23 7.60	2.7323	26 36 35.9	3.553	15	9 25 29.19	2.3409	20 36 17.8	10.725
16	7 25 51.37	2.7266	26 32 57.0	3.744	16	9 27 49.38	2.3320	20 25 31.2	10.828
17	7 28 34.79	2.7207	26 29 6.6	3.934	17	9 30 9.03	2.3231	20 14 38.5	10.928
18	7 31 17.85	2.7145	26 25 4.9	4.123	18	9 32 28.15	2.3143	20 3 39.9	11.025
19	7 34 0.53	2.7081	26 20 51.9	4.310	19	9 34 46.74	2.3055	19 52 35.5	11.121
20	7 36 42.82	2.7017	26 16 27.7	4.496	20	9 37 4.81	2.2968	19 41 25.4	11.215
21	7 39 24.73	2.6951	26 11 52.4	4.680	21	9 39 22.35	2.2880	19 30 9.7	11.308
22	7 42 6.23	2.6883	26 7 6.1	4.863	22	9 41 39.37	2.2793	19 18 48.5	11.398
23	7 44 47.33	2.6814	N.26 2 8.8	5.044	23	9 43 55.87	2.2707	N.19 7 21.9	11.487
SUNDAY 18.					TUESDAY 20.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	7 47 28.00	2.6743	N.25 57 0.8	5.223	0	9 46 11.85	2.2621	N.18 55 50.0	11.574
1	7 50 8.24	2.6671	25 51 42.1	5.400	1	9 48 27.32	2.2536	18 44 13.0	11.658
2	7 52 48.05	2.6598	25 46 12.8	5.575	2	9 50 42.28	2.2451	18 32 31.0	11.742
3	7 55 27.42	2.6523	25 40 33.0	5.749	3	9 52 56.73	2.2365	18 20 44.0	11.823
4	7 58 6.33	2.6448	25 34 42.9	5.922	4	9 55 10.67	2.2282	18 8 52.2	11.903
5	8 0 44.79	2.6372	25 28 42.5	6.092	5	9 57 24.11	2.2199	17 56 55.7	11.980
6	8 3 22.79	2.6294	25 22 31.9	6.261	6	9 59 37.06	2.2117	17 44 54.6	12.057
7	8 6 0.32	2.6215	25 16 11.2	6.428	7	10 1 49.51	2.2034	17 32 48.9	12.132
8	8 8 37.37	2.6135	25 9 40.6	6.592	8	10 4 1.47	2.1953	17 20 38.8	12.204
9	8 11 13.94	2.6054	25 3 0.2	6.755	9	10 6 12.95	2.1873	17 8 24.4	12.275
10	8 13 50.02	2.5973	24 56 10.1	6.916	10	10 8 23.94	2.1793	16 56 5.8	12.345
11	8 16 25.61	2.5891	24 49 10.3	7.075	11	10 10 34.46	2.1713	16 43 43.0	12.413
12	8 19 0.71	2.5807	24 42 1.0	7.233	12	10 12 44.50	2.1634	16 31 16.2	12.479
13	8 21 35.30	2.5723	24 34 42.4	7.388	13	10 14 54.07	2.1557	16 18 45.5	12.543
14	8 24 9.39	2.5639	24 27 14.5	7.542	14	10 17 3.18	2.1480	16 6 11.0	12.607
15	8 26 42.97	2.5553	24 19 37.5	7.693	15	10 19 11.83	2.1403	15 53 32.7	12.668
16	8 29 16.03	2.5467	24 11 51.4	7.842	16	10 21 20.02	2.1328	15 40 50.8	12.728
17	8 31 48.57	2.5380	24 3 56.4	7.989	17	10 23 27.76	2.1253	15 28 5.4	12.786
18	8 34 20.59	2.5293	23 55 52.7	8.134	18	10 25 35.05	2.1178	15 15 16.5	12.843
19	8 36 52.09	2.5206	23 47 40.3	8.278	19	10 27 41.89	2.1104	15 2 24.2	12.898
20	8 39 23.06	2.5118	23 39 19.3	8.420	20	10 29 48.30	2.1032	14 49 28.7	12.952
21	8 41 53.50	2.5028	23 30 49.9	8.559	21	10 31 54.27	2.0960	14 36 30.0	13.005
22	8 44 23.40	2.4939	23 22 12.2	8.697	22	10 33 59.82	2.0890	14 23 28.1	13.056
23	8 46 52.77	2.4851	23 13 26.3	8.832	23	10 36 4.95	2.0819	14 10 23.3	13.105
24	8 49 21.61	2.4761	N.23 4 32.4	8.965	24	10 38 9.65	2.0749	N.13 57 15.5	13.153

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
WEDNESDAY 21.					FRIDAY 23.				
0	10 38 9.65	2.0749	N. 13 57 15.5	13.153	0	12 11 24.99	1.8447	N. 2 53 44.2	14.090
1	10 40 13.94	2.0681	13 44 4.9	13.200	1	12 13 15.59	1.8421	2 39 38.9	14.087
2	10 42 17.82	2.0613	13 30 51.5	13.245	2	12 15 6.04	1.8395	2 25 33.8	14.082
3	10 44 21.30	2.0547	13 17 35.5	13.288	3	12 16 56.33	1.8370	2 11 29.1	14.076
4	10 46 24.38	2.0480	13 4 16.9	13.331	4	12 18 46.48	1.8347	1 57 24.7	14.070
5	10 48 27.06	2.0415	12 50 55.8	13.373	5	12 20 36.49	1.8323	1 43 20.7	14.063
6	10 50 29.36	2.0351	12 37 32.2	13.413	6	12 22 26.36	1.8301	1 29 17.1	14.056
7	10 52 31.27	2.0288	12 24 6.3	13.451	7	12 24 16.10	1.8280	1 15 14.0	14.048
8	10 54 32.81	2.0225	12 10 38.1	13.488	8	12 26 5.72	1.8260	1 1 11.4	14.038
9	10 56 33.97	2.0163	11 57 7.7	13.525	9	12 27 55.22	1.8240	0 47 9.4	14.028
10	10 58 34.76	2.0102	11 43 35.1	13.560	10	12 29 44.60	1.8221	0 33 8.1	14.017
11	11 0 35.19	2.0043	11 30 0.5	13.593	11	12 31 33.87	1.8203	0 19 7.4	14.006
12	11 2 35.27	1.9983	11 16 23.9	13.625	12	12 33 23.03	1.8185	N. 0 5 7.4	13.993
13	11 4 34.99	1.9925	11 2 45.5	13.656	13	12 35 12.09	1.8169	S. 0 8 51.8	13.981
14	11 6 34.37	1.9868	10 49 5.2	13.687	14	12 37 1.06	1.8153	0 22 50.3	13.968
15	11 8 33.40	1.9811	10 35 23.1	13.715	15	12 38 49.93	1.8138	0 36 47.9	13.953
16	11 10 32.10	1.9756	10 21 39.4	13.743	16	12 40 38.72	1.8125	0 50 44.7	13.938
17	11 12 30.47	1.9701	10 7 54.0	13.769	17	12 42 27.43	1.8112	1 4 40.5	13.922
18	11 14 28.51	1.9647	9 54 7.1	13.794	18	12 44 16.06	1.8099	1 18 35.3	13.906
19	11 16 26.23	1.9594	9 40 18.7	13.818	19	12 46 4.62	1.8088	1 32 29.2	13.889
20	11 18 23.64	1.9543	9 26 28.9	13.842	20	12 47 53.12	1.8078	1 46 22.0	13.872
21	11 20 20.74	1.9491	9 12 37.7	13.864	21	12 49 41.55	1.8068	2 0 13.8	13.853
22	11 22 17.53	1.9440	8 58 45.2	13.885	22	12 51 29.93	1.8058	2 14 4.4	13.833
23	11 24 14.02	1.9391	N. 8 44 51.5	13.905	23	12 53 18.25	1.8049	S. 2 27 53.8	13.813
THURSDAY 22.					SATURDAY 24.				
0	11 26 10.22	1.9343	N. 8 30 56.6	13.923	0	12 55 6.52	1.8042	S. 2 41 42.0	13.793
1	11 28 6.14	1.9296	8 17 0.7	13.941	1	12 56 54.75	1.8035	2 55 29.0	13.773
2	11 30 1.77	1.9248	8 3 3.7	13.958	2	12 58 42.94	1.8029	3 9 14.7	13.750
3	11 31 57.12	1.9202	7 49 5.7	13.974	3	13 0 31.10	1.8024	3 22 59.0	13.728
4	11 33 52.20	1.9158	7 35 6.8	13.988	4	13 2 19.23	1.8019	3 36 42.0	13.705
5	11 35 47.02	1.9115	7 21 7.1	14.002	5	13 4 7.33	1.8015	3 50 23.6	13.681
6	11 37 41.58	1.9072	7 7 6.6	14.015	6	13 5 55.41	1.8013	4 4 3.7	13.657
7	11 39 35.88	1.9029	6 53 5.3	14.027	7	13 7 43.48	1.8010	4 17 42.4	13.632
8	11 41 29.93	1.8988	6 39 3.4	14.038	8	13 9 31.53	1.8008	4 31 19.5	13.606
9	11 43 23.73	1.8947	6 25 0.8	14.048	9	13 11 19.58	1.8008	4 44 55.1	13.579
10	11 45 17.29	1.8908	6 10 57.7	14.057	10	13 13 7.63	1.8008	4 58 29.0	13.552
11	11 47 10.62	1.8869	5 56 54.0	14.065	11	13 14 55.68	1.8009	5 12 1.3	13.524
12	11 49 3.72	1.8832	5 42 49.9	14.072	12	13 16 43.74	1.8011	5 25 31.9	13.496
13	11 50 56.60	1.8795	5 28 45.4	14.078	13	13 18 31.81	1.8013	5 39 0.8	13.467
14	11 52 49.26	1.8758	5 14 40.5	14.083	14	13 20 19.89	1.8016	5 52 27.9	13.437
15	11 54 41.70	1.8723	5 0 35.4	14.088	15	13 22 8.00	1.8020	6 5 53.2	13.407
16	11 56 33.94	1.8690	4 46 30.0	14.092	16	13 23 56.13	1.8024	6 19 16.7	13.376
17	11 58 25.98	1.8657	4 32 24.4	14.094	17	13 25 44.29	1.8029	6 32 38.3	13.344
18	12 0 17.82	1.8623	4 18 18.7	14.096	18	13 27 32.48	1.8035	6 45 58.0	13.312
19	12 2 9.46	1.8592	4 4 12.9	14.098	19	13 29 20.71	1.8042	6 59 15.7	13.279
20	12 4 0.92	1.8562	3 50 7.0	14.098	20	13 31 8.98	1.8049	7 12 31.5	13.246
21	12 5 52.20	1.8532	3 36 1.2	14.097	21	13 32 57.30	1.8057	7 25 45.2	13.211
22	12 7 43.30	1.8503	3 21 55.4	14.096	22	13 34 45.66	1.8065	7 38 56.8	13.176
23	12 9 34.23	1.8474	3 7 49.7	14.093	23	13 36 34.08	1.8073	7 52 6.3	13.140
24	12 11 24.99	1.8447	N. 2 53 44.2	14.090	24	13 38 22.56	1.8085	S. 8 5 13.6	13.104

## GREENWICH MEAN TIME.

## THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.	Hour.	Right Ascension.	Diff. for 1 Minute.	Declination.	Diff. for 1 Minute.
SUNDAY 25.					TUESDAY 27.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	13 38 22.56	1.8085	S. 8 5 13.6	13.104	0	15 7 33.22	1.9288	S. 17 39 32.8	10.552
1	13 40 11.10	1.8096	8 18 18.8	13.067	1	15 9 29.06	1.9326	17 50 3.8	10.481
2	13 41 59.71	1.8108	8 31 21.7	13.029	2	15 11 25.13	1.9364	18 0 30.5	10.409
3	13 43 48.39	1.8120	8 44 22.3	12.991	3	15 13 21.43	1.9403	18 10 52.9	10.337
4	13 45 37.15	1.8133	8 57 20.6	12.953	4	15 15 17.96	1.9441	18 21 10.9	10.263
5	13 47 25.98	1.8146	9 10 16.6	12.913	5	15 17 14.72	1.9479	18 31 24.4	10.188
6	13 49 14.90	1.8160	9 23 10.2	12.873	6	15 19 11.71	1.9518	18 41 33.4	10.113
7	13 51 3.90	1.8175	9 36 1.3	12.832	7	15 21 8.94	1.9558	18 51 37.9	10.037
8	13 52 53.00	1.8191	9 48 50.0	12.790	8	15 23 6.41	1.9598	19 1 37.8	9.959
9	13 54 42.19	1.8207	10 1 36.1	12.748	9	15 25 4.12	1.9638	19 11 33.0	9.882
10	13 56 31.48	1.8223	10 14 19.7	12.705	10	15 27 2.07	1.9679	19 21 23.6	9.804
11	13 58 20.87	1.8241	10 27 0.7	12.662	11	15 29 0.27	1.9721	19 31 9.5	9.724
12	14 0 10.37	1.8259	10 39 39.1	12.618	12	15 30 58.72	1.9762	19 40 50.5	9.643
13	14 1 59.98	1.8278	10 52 14.8	12.573	13	15 32 57.41	1.9803	19 50 26.7	9.563
14	14 3 49.71	1.8298	11 4 47.8	12.528	14	15 34 56.35	1.9844	19 59 58.0	9.481
15	14 5 39.55	1.8317	11 17 18.1	12.481	15	15 36 55.54	1.9886	20 9 24.4	9.398
16	14 7 29.51	1.8338	11 29 45.5	12.433	16	15 38 54.98	1.9928	20 18 45.8	9.315
17	14 9 19.60	1.8359	11 42 10.1	12.386	17	15 40 54.67	1.9970	20 28 2.2	9.231
18	14 11 9.82	1.8381	11 54 31.8	12.338	18	15 42 54.62	2.0013	20 37 13.5	9.146
19	14 13 0.17	1.8403	12 6 50.6	12.288	19	15 44 54.82	2.0055	20 46 19.7	9.060
20	14 14 50.66	1.8427	12 19 6.4	12.239	20	15 46 55.28	2.0098	20 55 20.7	8.973
21	14 16 41.29	1.8450	12 31 19.3	12.189	21	15 48 56.00	2.0141	21 4 16.4	8.884
22	14 18 32.06	1.8474	12 43 29.1	12.138	22	15 50 56.97	2.0184	21 13 6.8	8.796
23	14 20 22.98	1.8499	S. 12 55 35.8	12.085	23	15 52 58.20	2.0227	S. 21 21 51.9	8.707
MONDAY 26.					WEDNESDAY 28.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	14 22 14.05	1.8524	S. 13 7 39.3	12.033	0	15 54 59.69	2.0270	S. 21 30 31.6	8.617
1	14 24 5.27	1.8550	13 19 39.7	11.980	1	15 57 1.44	2.0313	21 39 5.9	8.526
2	14 25 56.65	1.8577	13 31 36.9	11.926	2	15 59 3.45	2.0357	21 47 34.7	8.433
3	14 27 48.19	1.8604	13 43 30.8	11.872	3	16 1 5.72	2.0401	21 55 57.9	8.341
4	14 29 39.90	1.8632	13 55 21.5	11.817	4	16 3 8.26	2.0444	22 4 15.6	8.248
5	14 31 31.77	1.8660	14 7 8.8	11.760	5	16 5 11.06	2.0488	22 12 27.6	8.153
6	14 33 23.82	1.8689	14 18 52.7	11.703	6	16 7 14.12	2.0532	22 20 33.9	8.058
7	14 35 16.04	1.8718	14 30 33.1	11.645	7	16 9 17.44	2.0576	22 28 34.5	7.962
8	14 37 8.43	1.8747	14 42 10.1	11.587	8	16 11 21.03	2.0620	22 36 29.3	7.865
9	14 39 1.00	1.8778	14 53 43.6	11.528	9	16 13 24.88	2.0663	22 44 18.3	7.768
10	14 40 53.76	1.8808	15 5 13.5	11.468	10	16 15 28.99	2.0707	22 52 1.4	7.668
11	14 42 46.70	1.8840	15 16 39.8	11.408	11	16 17 33.36	2.0751	22 59 38.5	7.568
12	14 44 39.84	1.8873	15 28 2.4	11.347	12	16 19 38.00	2.0795	23 7 9.6	7.468
13	14 46 33.17	1.8904	15 39 21.4	11.285	13	16 21 42.90	2.0838	23 14 34.7	7.368
14	14 48 26.69	1.8937	15 50 36.6	11.222	14	16 23 48.06	2.0882	23 21 53.7	7.265
15	14 50 20.41	1.8969	16 1 48.0	11.158	15	16 25 53.48	2.0925	23 29 6.5	7.162
16	14 52 14.32	1.9003	16 12 55.6	11.094	16	16 27 59.16	2.0968	23 36 13.1	7.058
17	14 54 8.44	1.9038	16 23 59.3	11.029	17	16 30 5.09	2.1011	23 43 13.5	6.954
18	14 56 2.77	1.9073	16 34 59.1	10.963	18	16 32 11.28	2.1053	23 50 7.6	6.849
19	14 57 57.31	1.9108	16 45 54.9	10.897	19	16 34 17.73	2.1097	23 56 55.4	6.743
20	14 59 52.06	1.9143	16 56 46.7	10.830	20	16 36 24.44	2.1139	24 3 36.8	6.636
21	15 1 47.02	1.9178	17 7 34.5	10.762	21	16 38 31.40	2.1181	24 10 11.7	6.528
22	15 3 42.20	1.9215	17 18 18.1	10.693	22	16 40 38.61	2.1223	24 16 40.2	6.420
23	15 5 37.60	1.9252	17 28 57.6	10.623	23	16 42 46.08	2.1266	24 23 2.1	6.310
24	15 7 33.22	1.9288	S. 17 39 32.8	10.552	24	16 44 53.80	2.1308	S. 24 29 17.4	6.200



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
3	SUN W.	17 52 5	3428	19 13 50	3421	20 35 43	3415	21 57 43	3408
	Fomalhaut E.	65 7 34	3438	63 42 10	3438	62 16 46	3440	60 51 24	3442
	α Pegasi E.	85 38 59	3411	84 16 55	3410	82 54 50	3408	81 32 43	3407
	SATURN E.	122 10 28	3005	120 40 22	3002	119 10 12	2998	117 39 57	2993
4	SUN W.	28 49 35	3376	30 12 19	3369	31 35 11	3363	32 58 10	3356
	Fomalhaut E.	53 45 29	3263	52 20 34	3268	50 55 45	3275	49 31 5	3283
	α Pegasi E.	74 41 55	3407	73 19 46	3408	71 57 38	3410	70 35 32	3412
	SATURN E.	110 7 15	2969	108 36 24	2964	107 5 27	2958	105 34 22	2953
	α Arietis E.	116 40 6	3087	115 11 40	3080	113 43 6	3073	112 14 23	3065
5	SUN W.	39 55 8	3319	41 18 57	3311	42 42 56	3302	44 7 5	3294
	Fomalhaut E.	42 30 36	3346	41 7 18	3365	39 44 21	3386	38 21 49	3411
	α Pegasi E.	63 45 57	3433	62 24 18	3440	61 2 47	3448	59 41 25	3458
	SATURN E.	97 57 5	2921	96 25 13	2914	94 53 12	2906	93 21 1	2899
	α Arietis E.	104 48 19	3024	103 18 36	3016	101 48 43	3007	100 18 39	2999
6	SUN W.	51 10 21	3248	52 35 33	3238	54 0 57	3227	55 26 34	3217
	α Pegasi E.	52 57 39	3525	51 37 43	3545	50 18 9	3567	48 58 59	3591
	SATURN E.	85 37 39	2858	84 4 26	2848	82 31 1	2839	80 57 24	2830
	α Arietis E.	92 45 40	2955	91 14 30	2946	89 43 9	2936	88 11 36	2927
7	SUN W.	62 37 53	3159	64 4 51	3147	65 32 3	3134	66 59 31	3122
	SATURN E.	73 6 6	2777	71 31 9	2766	69 55 57	2755	68 20 29	2744
	α Arietis E.	80 30 45	2876	78 57 56	2866	77 24 53	2855	75 51 37	2845
	Aldebaran E.	110 47 10	2831	109 13 23	2819	107 39 20	2807	106 5 1	2795
8	SUN W.	74 20 52	3052	75 50 0	3038	77 19 26	3023	78 49 11	3008
	SATURN E.	60 19 13	2680	58 42 6	2667	57 4 42	2653	55 26 59	2639
	α Arietis E.	68 1 46	2790	66 27 4	2779	64 52 8	2767	63 16 57	2756
	Aldebaran E.	98 9 16	2729	96 33 15	2715	94 56 55	2701	93 20 16	2687
9	SUN W.	86 22 43	2928	87 54 26	2912	89 26 30	2895	90 58 55	2878
	α Aquilæ W.	53 4 31	4034	54 15 37	3959	55 27 58	3888	56 41 30	3821
	SATURN E.	47 13 34	2566	45 33 53	2551	43 53 51	2535	42 13 27	2520
	α Arietis E.	55 17 27	2702	53 40 50	2693	52 4 0	2684	50 26 58	2675
	Aldebaran E.	85 12 14	2614	83 33 38	2599	81 54 41	2583	80 15 23	2568
10	SUN W.	98 46 33	2791	100 21 13	2774	101 56 15	2756	103 31 40	2738
	α Aquilæ W.	63 5 21	3539	64 25 2	3492	65 45 35	3447	67 6 58	3404
	SATURN E.	33 46 0	2441	32 3 23	2425	30 20 24	2409	28 37 1	2393
	α Arietis E.	42 19 2	2642	40 41 4	2639	39 3 2	2638	37 24 58	2639
	Aldebaran E.	71 53 32	2490	70 12 5	2475	68 30 16	2459	66 48 5	2443
	Pollux E.	115 53 45	2455	114 11 28	2438	112 28 48	2422	110 45 44	2405
11	SUN W.	111 34 41	2650	113 12 28	2632	114 50 39	2615	116 29 13	2599
	α Aquilæ W.	74 5 16	3223	75 30 58	3192	76 57 17	3163	78 24 11	3136
	Fomalhaut W.	40 40 29	2734	42 16 24	2692	43 53 15	2651	45 31 1	2613
	Aldebaran E.	58 11 43	2368	56 27 23	2354	54 42 42	2340	52 57 41	2326
	Pollux E.	102 4 27	2322	100 19 0	2306	98 33 9	2290	96 46 54	2274
12	α Aquilæ W.	85 46 13	3024	87 15 56	3008	88 45 59	2992	90 16 22	2977

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Midnight.	P. L. of Diff.	XV <sup>h</sup>	P. L. of Diff.	XVIII <sup>h</sup>	P. L. of Diff.	XXI <sup>h</sup>	P. L. of Diff.
3	SUN	W.	• • •		• • •		• • •		• • •	
	Fomalhaut	E.	23 19 51	3401	24 42 6	3395	26 4 28	3383	27 26 58	3382
	α Pegasi	E.	59 26 4	3445	58 0 48	3449	56 35 37	3453	55 10 30	3458
	SATURN	E.	80 10 35	3406	78 48 25	3406	77 26 15	3406	76 4 5	3406
		E.	116 9 36	2989	114 39 10	2985	113 8 38	2980	111 38 0	2974
4	SUN	W.	34 21 17	3349	35 44 32	3342	37 7 55	3334	38 31 27	3326
	Fomalhaut	E.	48 6 34	3293	46 42 14	3294	45 18 7	3316	43 54 14	3330
	α Pegasi	E.	69 13 29	3415	67 51 29	3419	66 29 33	3423	65 7 42	3428
	SATURN	E.	104 3 10	2947	102 31 50	2941	101 0 23	2935	99 28 48	2928
	α Arietis	E.	110 45 30	3056	109 16 27	3048	107 47 14	3040	106 17 52	3032
5	SUN	W.	45 31 23	3285	46 55 51	3276	48 20 30	3267	49 45 20	3258
	Fomalhaut	E.	36 59 45	3440	35 38 13	3474	34 17 20	3513	32 57 10	3556
	α Pegasi	E.	58 20 14	3468	56 59 14	3480	55 38 27	3493	54 17 55	3508
	SATURN	E.	91 48 41	2891	90 16 11	2883	88 43 31	2875	87 10 40	2867
	α Arietis	E.	98 48 25	2990	97 18 0	2982	95 47 25	2973	94 16 38	2964
6	SUN	W.	56 52 23	3206	58 18 25	3195	59 44 40	3183	61 11 9	3171
	α Pegasi	E.	47 40 15	3619	46 22 1	3652	45 4 23	3688	43 47 24	3728
	SATURN	E.	79 23 35	2820	77 49 33	2810	76 15 18	2799	74 40 49	2788
	α Arietis	E.	86 39 51	2917	85 7 54	2907	83 35 44	2897	82 3 21	2887
7	SUN	W.	68 27 14	3109	69 55 13	3095	71 23 29	3081	72 52 2	3067
	SATURN	E.	66 44 47	2732	65 8 49	2719	63 32 34	2706	61 56 2	2693
	α Arietis	E.	74 18 7	2834	72 44 23	2823	71 10 25	2812	69 36 13	2801
	Aldebaran	E.	104 30 26	2782	102 55 34	2769	101 20 26	2756	99 45 0	2742
8	SUN	W.	80 19 14	2993	81 49 36	2977	83 20 18	2961	84 51 20	2944
	SATURN	E.	53 48 57	2625	52 10 35	2611	50 31 55	2596	48 52 55	2581
	α Arietis	E.	61 41 32	2745	60 5 52	2735	58 29 58	2724	56 53 50	2713
	Aldebaran	E.	91 43 19	2672	90 6 2	2658	88 28 26	2643	86 50 30	2629
9	SUN	W.	92 31 42	2861	94 4 51	2844	95 38 22	2826	97 12 16	2808
	α Aquilæ	W.	57 56 11	3758	59 11 57	3698	60 28 46	3642	61 46 35	3589
	SATURN	E.	40 32 42	2504	38 51 35	2488	37 10 6	2472	35 28 14	2457
	α Arietis	E.	48 49 43	2666	47 12 17	2658	45 34 40	2651	43 56 54	2646
	Aldebaran	E.	78 35 44	2553	76 55 44	2537	75 15 22	2521	73 34 38	2505
10	SUN	W.	105 7 29	2720	106 43 42	2703	108 20 18	2685	109 57 18	2668
	α Aquilæ	W.	68 29 10	3365	69 52 7	3326	71 15 48	3289	72 40 12	3255
	SATURN	E.	26 53 16	2376	25 9 7	2360	23 24 36	2344	21 39 41	2328
	α Arietis	E.	35 46 55	2643	34 8 58	2652	32 31 13	2663	30 53 44	2678
	Aldebaran	E.	65 5 32	2428	63 22 37	2413	61 39 20	2398	59 55 42	2383
	Pollux	E.	109 2 16	2388	107 18 24	2372	105 34 9	2355	103 49 30	2339
11	SUN	W.	118 8 10	2582	119 47 30	2565	121 27 13	2549	123 7 19	2533
	α Aquilæ	W.	79 51 37	3111	81 19 34	3087	82 48 0	3064	84 16 54	3043
	Fomalhaut	W.	47 9 38	2578	48 49 3	2545	50 29 14	2514	52 10 8	2485
	Aldebaran	E.	51 12 20	2313	49 26 40	2301	47 40 41	2289	45 54 25	2278
	Pollux	E.	95 0 16	2258	93 13 14	2241	91 25 48	2226	89 37 59	2211
12	α Aquilæ	W.	91 47 3	2965	93 17 59	2955	94 49 8	2947	96 20 27	2941

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.		Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
			° ' "		° ' "		° ' "		° ' "	
12	Fomalhaut	W.	53 51 42	2458	55 33 55	2438	57 16 44	2407	59 0 9	2384
	α Pegasi	W.	38 16 34	3339	39 40 0	3241	41 5 21	3151	42 32 29	3070
	Aldebaran	E.	44 7 53	2268	42 21 6	2258	40 34 4	2249	38 46 50	2243
	Pollux	E.	87 49 48	2196	86 1 15	2181	84 12 19	2167	82 23 2	2153
13	α Aquilæ	W.	97 51 54	2936	99 23 27	2934	100 55 3	2935	102 26 38	2937
	Fomalhaut	W.	67 44 58	2287	69 31 17	2270	71 18 1	2255	73 5 7	2241
	α Pegasi	W.	50 10 17	2766	51 45 29	2720	53 21 42	2675	54 58 50	2641
	Pollux	E.	73 11 27	2089	71 20 11	2078	69 28 37	2067	67 36 47	2057
	Regulus	E.	109 33 59	2103	107 43 4	2090	105 51 50	2079	104 0 18	2069
14	Fomalhaut	W.	82 5 17	2186	83 54 5	2179	85 43 4	2173	87 32 13	2167
	α Pegasi	W.	63 15 59	2496	64 57 18	2476	66 39 5	2457	68 21 19	2439
	SATURN	W.	24 6 37	2005	26 0 4	1998	27 53 41	1992	29 47 28	1987
	Pollux	E.	58 13 58	2016	56 20 47	2009	54 27 26	2003	52 33 57	1998
	Regulus	E.	94 38 59	2086	92 46 5	2019	90 53 1	2014	88 59 48	2009
15	Fomalhaut	W.	96 39 30	2156	98 29 4	2157	100 18 36	2160	102 8 4	2164
	α Pegasi	W.	76 57 39	2383	78 41 38	2378	80 25 45	2374	82 9 58	2371
	SATURN	W.	39 18 2	1972	41 12 20	1972	43 6 39	1972	45 0 57	1973
	α Arietis	W.	33 26 8	2245	35 13 28	2223	37 1 22	2203	38 49 46	2186
	Pollux	E.	43 5 1	1986	41 11 5	1986	39 17 8	1987	37 23 13	1989
	Regulus	E.	79 32 8	1995	77 38 26	1995	75 44 43	1995	73 51 1	1996
16	α Pegasi	W.	90 51 14	2382	92 35 15	2389	94 19 6	2397	96 2 45	2407
	SATURN	W.	54 31 39	1990	56 25 29	1996	58 19 10	2003	60 12 40	2010
	α Arietis	W.	47 56 38	2143	49 46 31	2141	51 36 28	2141	53 26 25	2142
	Pollux	E.	27 54 48	2011	26 1 31	2019	24 8 27	2028	22 15 36	2039
	Regulus	E.	64 23 30	2016	62 30 21	2023	60 37 22	2030	58 44 34	2037
	Spica	E.	118 26 30	2014	116 33 17	2020	114 40 13	2026	112 47 19	2032
17	SATURN	W.	69 36 58	2057	71 29 3	2068	73 20 51	2081	75 12 20	2094
	α Arietis	W.	62 35 7	2166	64 24 25	2174	66 13 31	2184	68 2 23	2194
	Aldebaran	W.	32 6 56	2183	33 55 49	2184	35 44 41	2186	37 33 29	2191
	Regulus	E.	49 24 6	2090	47 32 52	2103	45 41 58	2117	43 51 25	2138
	Spica	E.	103 25 47	2077	101 34 13	2089	99 42 57	2101	97 51 59	2114
	JUPITER	E.	117 39 35	2116	115 49 0	2128	113 58 44	2141	112 8 47	2154
18	SATURN	W.	84 24 34	2166	86 13 53	2181	88 2 48	2197	89 51 19	2214
	α Arietis	W.	77 2 27	2257	78 49 30	2272	80 36 10	2288	82 22 28	2304
	Aldebaran	W.	46 34 56	2237	48 22 28	2249	50 9 42	2262	51 56 37	2276
	Regulus	E.	34 44 43	2219	32 56 44	2240	31 9 16	2262	29 22 20	2285
	Spica	E.	88 42 17	2185	86 53 27	2201	85 5 1	2217	83 16 59	2234
	JUPITER	E.	103 4 7	2226	101 16 18	2242	99 28 53	2258	97 41 52	2275
	MARS	E.	124 23 31	2385	122 39 35	2402	120 56 3	2419	119 12 56	2437
19	SATURN	W.	98 47 34	2303	100 33 29	2321	102 18 58	2340	104 3 59	2359
	α Arietis	W.	91 7 53	2391	92 51 41	2410	94 35 3	2429	96 17 57	2448
	Aldebaran	W.	60 45 49	2355	62 30 29	2372	64 14 45	2389	65 58 36	2407
	Pollux	W.	16 28 8	2341	18 13 8	2355	19 57 48	2369	21 42 8	2384
	Spica	E.	74 23 13	2324	72 37 48	2342	70 52 49	2361	69 8 18	2380
	JUPITER	E.	88 53 5	2364	87 8 39	2382	85 24 39	2401	83 41 6	2421



## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
12	Fomalhaut W.	60 44 7	2362	62 28 37	2342	64 13 36	2323	65 59 4	2304
	α Pegasi W.	44 1 16	2397	45 31 33	2331	47 3 13	2370	48 36 10	2316
	Aldebaran E.	36 59 27	2238	35 11 56	2234	33 24 19	2232	31 36 39	2232
	Pollux E.	80 33 23	2139	78 43 24	2126	76 53 4	2113	75 2 25	2101
13	α Aquilæ W.	103 58 10	2042	105 29 35	2049	107 0 52	2058	108 31 57	2072
	Fomalhaut W.	74 52 33	2228	76 40 19	2216	78 28 22	2205	80 16 42	2195
	α Pegasi W.	56 36 49	2607	58 15 35	2575	59 55 4	2546	61 35 13	2520
	Pollux E.	65 44 41	2047	63 52 20	2038	61 59 45	2030	60 6 57	2023
	Regulus E.	102 8 31	2059	100 16 29	2050	98 24 12	2041	96 31 42	2033
14	Fomalhaut W.	89 21 30	2163	91 10 54	2159	93 0 23	2157	94 49 56	2156
	α Pegasi W.	70 3 58	2425	71 46 58	2412	73 30 16	2400	75 13 51	2391
	SATURN W.	31 41 23	1983	33 35 25	1979	35 29 33	1976	37 23 46	1974
	Pollux E.	50 40 20	1994	48 46 36	1991	46 52 48	1989	44 58 56	1987
	Regulus E.	87 6 27	2004	85 12 59	2001	83 19 26	1998	81 25 48	1996
15	Fomalhaut W.	103 57 27	2169	105 46 42	2175	107 35 47	2182	109 24 41	2190
	α Pegasi W.	83 54 15	2370	85 38 33	2370	87 22 50	2372	89 7 5	2376
	SATURN W.	46 55 14	1975	48 49 28	1978	50 43 37	1981	52 37 41	1985
	α Arietis W.	40 38 36	2172	42 27 46	2161	44 17 12	2153	46 6 51	2147
	Pollux E.	35 29 21	1991	33 35 33	1995	31 41 50	1995	29 48 15	2005
	Regulus E.	71 57 21	1998	70 3 45	2001	68 10 13	2005	66 16 48	2010
16	α Pegasi W.	97 46 10	2419	99 29 18	2432	101 12 8	2446	102 54 37	2462
	SATURN W.	62 5 59	2018	63 59 5	2026	65 51 58	2036	67 44 36	2046
	α Arietis W.	55 16 21	2144	57 6 13	2148	58 55 59	2153	60 45 38	2159
	Pollux E.	20 23 2	2051	18 30 47	2065	16 38 54	2082	14 47 27	2101
	Regulus E.	56 51 58	2046	54 59 36	2056	53 7 29	2067	51 15 39	2078
	Spica E.	110 54 34	2039	109 2 1	2048	107 9 42	2057	105 17 37	2067
17	SATURN W.	77 3 29	2107	78 54 18	2121	80 44 46	2136	82 34 51	2151
	α Arietis W.	69 50 59	2205	71 39 18	2217	73 27 20	2230	75 15 3	2243
	Aldebaran W.	39 22 10	2198	41 10 41	2206	42 59 0	2215	44 47 6	2225
	Regulus E.	42 1 15	2147	40 11 28	2164	38 22 6	2182	36 33 11	2200
	Spica E.	96 1 21	2127	94 11 3	2141	92 21 6	2155	90 31 30	2170
	JUPITER E.	110 19 9	2167	108 29 51	2181	106 40 55	2195	104 52 20	2210
18	SATURN W.	91 39 26	2231	93 27 7	2248	95 14 23	2266	97 1 12	2285
	α Arietis W.	84 8 22	2320	85 53 52	2337	87 38 57	2354	89 23 38	2372
	Aldebaran W.	53 43 12	2291	55 29 25	2306	57 15 16	2322	59 0 44	2338
	Regulus E.	27 35 58	2310	25 50 13	2338	24 5 9	2368	22 20 48	2399
	Spica E.	81 29 22	2251	79 42 11	2268	77 55 25	2286	76 9 6	2305
	JUPITER E.	95 55 15	2292	94 9 4	2309	92 23 18	2327	90 37 58	2346
	MARS E.	117 30 14	2455	115 47 57	2473	114 6 5	2492	112 24 40	2510
19	SATURN W.	105 48 33	2378	107 32 39	2397	109 16 19	2416	110 59 31	2436
	α Arietis W.	98 0 24	2467	99 42 23	2487	101 23 54	2507	103 4 58	2527
	Aldebaran W.	67 42 1	2425	69 25 0	2443	71 7 34	2461	72 49 42	2480
	Pollux W.	23 26 5	2401	25 9 39	2418	26 52 48	2436	28 35 32	2454
	Spica E.	67 24 15	2399	65 40 39	2419	63 57 31	2438	62 14 51	2458
	JUPITER E.	81 58 1	2440	80 15 23	2459	78 33 12	2478	76 51 28	2497

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Noon.	P. L. of Diff.	IIIh	P. L. of Diff.	VIh	P. L. of Diff.	IXh	P. L. of Diff.
19	MARS E.	110 43 40	2529	109 3 7	2549	107 23 2	2569	105 43 24	2589
20	$\alpha$ Arietis W.	104 45 33	2548	106 25 39	2569	108 5 16	2590	109 44 25	2611
	Aldebaran W.	74 31 24	2499	76 12 39	2517	77 53 29	2535	79 33 53	2554
	Pollux W.	30 17 50	2472	31 59 43	2490	33 41 10	2508	35 22 12	2526
	Spica E.	60 32 38	2478	58 50 54	2497	57 9 37	2517	55 28 48	2537
	JUPITER E.	75 10 10	2517	73 29 20	2537	71 48 58	2556	70 9 3	2575
	MARS E.	97 32 3	2689	95 55 8	2709	94 18 41	2729	92 42 40	2750
	SUN E.	125 9 43	2808	123 35 25	2828	122 1 34	2849	120 28 10	2870
21	Aldebaran W.	87 49 25	2648	89 27 15	2666	91 4 40	2684	92 41 41	2702
	Pollux W.	43 40 59	2619	45 19 29	2637	46 57 34	2655	48 35 15	2672
	Spica E.	47 11 34	2636	45 33 28	2656	43 55 49	2676	42 18 37	2695
	JUPITER E.	61 55 57	2670	60 18 37	2688	58 41 41	2707	57 5 10	2725
	MARS E.	84 49 15	2850	83 15 52	2869	81 42 53	2888	80 10 19	2907
	SUN E.	112 47 40	2970	111 16 51	2990	109 46 26	3010	108 16 26	3029
22	Aldebaran W.	100 40 55	2739	102 15 37	2805	103 49 58	2821	105 23 58	2838
	Pollux W.	56 37 54	2756	58 13 19	2772	59 48 23	2788	61 23 7	2804
	Regulus W.	20 39 11	2862	22 12 19	2865	23 45 23	2869	25 18 22	2875
	Spica E.	34 19 4	2793	32 44 27	2813	31 10 16	2833	29 36 30	2853
	JUPITER E.	49 8 28	2811	47 34 15	2828	46 0 23	2844	44 26 52	2859
	MARS E.	72 33 23	2997	71 3 7	3014	69 33 13	3031	68 3 39	3048
	SUN E.	100 52 16	3122	99 24 33	3140	97 57 12	3157	96 30 11	3174
23	Pollux W.	69 11 52	2875	70 44 43	2888	72 17 17	2900	73 49 35	2912
	Regulus W.	33 0 52	2919	34 32 47	2928	36 4 30	2937	37 36 1	2946
	JUPITER E.	36 44 5	2931	35 12 26	2945	33 41 4	2958	32 9 59	2970
	MARS E.	60 40 46	3124	59 13 6	3139	57 45 44	3153	56 18 38	3165
	SUN E.	89 20 2	3253	87 54 55	3267	86 30 5	3281	85 5 32	3294
24	Pollux W.	81 27 22	2968	82 58 14	2977	84 28 55	2986	85 59 24	2995
	Regulus W.	45 10 39	2993	46 41 0	3001	48 11 11	3009	49 41 13	3017
	JUPITER E.	24 38 12	3025	23 8 31	3035	21 39 2	3045	20 9 45	3054
	SUN E.	78 6 29	3355	76 43 21	3366	75 20 26	3376	73 57 43	3386
25	Pollux W.	93 29 18	3033	94 58 50	3039	96 28 14	3045	97 57 31	3051
	Regulus W.	57 9 5	3051	58 38 15	3056	60 7 19	3061	61 36 16	3065
	SUN E.	67 6 44	3429	65 45 0	3436	64 23 24	3442	63 1 55	3448
26	Pollux W.	105 22 27	3071	106 51 12	3074	108 19 53	3076	109 48 31	3078
	Regulus W.	68 59 44	3084	70 28 13	3087	71 56 39	3089	73 25 2	3091
	Spica W.	15 17 50	3234	16 43 19	3212	18 9 14	3193	19 35 31	3178
	SUN E.	56 16 7	3473	54 55 13	3477	53 34 23	3480	52 13 37	3483
27	Regulus W.	80 46 32	3095	82 14 48	3095	83 43 4	3094	85 11 21	3093
	Spica W.	26 50 18	3138	28 17 42	3133	29 45 12	3129	31 12 47	3124
	SUN E.	45 30 28	3493	44 9 56	3494	42 49 25	3495	41 28 55	3496
28	Regulus W.	92 33 3	3086	94 1 30	3083	95 30 0	3081	96 58 33	3078
	Spica W.	38 32 5	3102	40 0 12	3098	41 28 24	3094	42 56 41	3089
	SUN E.	34 46 32	3497	33 26 3	3497	32 5 35	3497	30 45 7	3497

## GREENWICH MEAN TIME.

## LUNAR DISTANCES.

Day of the Month.	Name and Direction of Object.	Midnight.	P. L. of Diff.	XVh	P. L. of Diff.	XVIIIh	P. L. of Diff.	XXIh	P. L. of Diff.
19	MARS E.	104 4 13	2609	102 25 30	2629	100 47 14	2649	99 9 25	2669
20	α Arietis W.	111 23 6	2632	113 1 17	2653	114 39 0	2675	116 16 13	2696
	Aldebaran W.	81 13 51	2573	82 53 23	2592	84 32 29	2610	86 11 10	2629
	Pollux W.	37 2 49	2545	38 43 0	2564	40 22 45	2582	42 2 5	2601
	Spica E.	53 48 26	2557	52 8 32	2577	50 29 6	2597	48 50 7	2616
	JUPITER E.	68 29 33	2594	66 50 30	2613	65 11 54	2632	63 33 43	2651
	MARS E.	91 7 7	2770	89 32 0	2790	87 57 19	2810	86 23 4	2830
	SUN E.	118 55 12	2890	117 22 41	2910	115 50 35	2930	114 18 55	2950
21	Aldebaran W.	94 18 19	2720	95 54 32	2738	97 30 22	2755	99 5 50	2772
	Pollux W.	50 12 33	2689	51 49 28	2706	53 25 59	2723	55 2 8	2740
	Spica E.	40 41 50	2715	39 5 30	2734	37 29 35	2754	35 54 7	2773
	JUPITER E.	55 29 4	2743	53 53 21	2760	52 18 1	2777	50 43 3	2794
	MARS E.	78 38 9	2926	77 6 23	2944	75 35 0	2962	74 4 0	2980
	SUN E.	106 46 49	3048	105 17 36	3067	103 48 47	3086	102 20 20	3104
22	Aldebaran W.	106 57 37	2854	108 30 55	2869	110 3 54	2884	111 36 33	2899
	Pollux W.	62 57 30	2818	64 31 33	2833	66 5 18	2848	67 38 44	2862
	Regulus W.	26 51 13	2882	28 23 55	2891	29 56 26	2900	31 28 45	2909
	Spica E.	28 3 11	2874	26 30 19	2896	24 57 55	2919	23 26 0	2941
	JUPITER E.	42 53 40	2874	41 20 48	2889	39 48 16	2904	38 16 2	2917
	MARS E.	66 34 26	3064	65 5 32	3080	63 36 58	3095	62 8 43	3110
	SUN E.	95 3 31	3190	93 37 10	3207	92 11 9	3222	90 45 27	3237
23	Pollux W.	75 21 38	2924	76 53 25	2936	78 24 58	2947	79 56 17	2958
	Regulus W.	39 7 21	2956	40 38 28	2966	42 9 23	2975	43 40 7	2984
	JUPITER E.	30 39 9	2982	29 8 34	2994	27 38 14	3005	26 8 7	3015
	MARS E.	54 51 47	3178	53 25 12	3190	51 58 51	3202	50 32 45	3214
	SUN E.	83 41 14	3307	82 17 12	3320	80 53 24	3332	79 29 50	3344
24	Pollux W.	87 29 43	3004	88 59 51	3012	90 29 49	3019	91 59 38	3026
	Regulus W.	51 11 5	3024	52 40 47	3032	54 10 21	3038	55 39 47	3044
	JUPITER E.	18 40 39	3062	17 11 43	3070	15 42 57	3078	14 14 20	3086
	SUN E.	72 35 11	3396	71 12 50	3405	69 50 39	3413	68 28 37	3421
25	Pollux W.	99 26 41	3056	100 55 45	3060	102 24 44	3064	103 53 38	3068
	Regulus W.	63 5 8	3070	64 33 54	3074	66 2 35	3078	67 31 11	3081
	SUN E.	61 40 34	3454	60 19 19	3459	58 58 10	3464	57 37 6	3469
26	Pollux W.	111 17 7	3080	112 45 40	3082	114 14 12	3082	115 42 43	3083
	Regulus W.	74 53 23	3092	76 21 42	3093	77 49 59	3094	79 18 16	3095
	Spica W.	21 2 6	3168	22 28 54	3159	23 55 53	3151	25 23 1	3144
	SUN E.	50 52 54	3486	49 32 14	3488	48 11 37	3490	46 51 2	3491
27	Regulus W.	86 39 38	3092	88 7 56	3091	89 36 16	3090	91 4 38	3088
	Spica W.	32 40 28	3119	34 8 14	3114	35 36 6	3110	37 4 3	3106
	SUN E.	40 8 26	3496	38 47 57	3497	37 27 29	3497	36 7 1	3497
28	Regulus W.	98 27 9	3075	99 55 49	3072	101 24 33	3069	102 53 21	3065
	Spica W.	44 25 4	3085	45 53 32	3081	47 22 5	3076	48 50 44	3070
	SUN E.	29 24 38	3497	28 4 10	3497	26 43 43	3498	25 23 17	3499

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	19 55 30.65	+15.916	-22 47 13.0	+54.19	1 14.6	1	20 0 39.68	-7.911	-17 1 25.0	-37.79	23 10.8
2	20 1 48.46	15.559	22 24 53.2	57.43	1 17.0	2	19 57 47.18	6.455	17 16 22.6	36.93	23 4.6
3	20 7 57.04	15.146	22 1 18.4	60.44	1 19.2	3	19 55 30.08	4.969	17 30 53.8	35.60	22 59.0
4	20 13 54.93	14.668	21 36 34.3	63.18	1 21.2	4	19 53 48.63	3.490	17 44 48.6	33.91	22 53.9
5	20 19 40.49	14.117	21 10 48.0	65.62	1 23.0	5	19 52 42.26	2.049	17 57 59.0	31.91	22 49.4
6	20 25 11.87	+13.484	-20 44 8.0	+67.65	1 24.5	6	19 52 9.81	-0.666	-18 10 18.4	-29.67	22 45.5
7	20 30 27.03	12.762	20 16 44.5	69.22	1 25.8	7	19 52 9.71	+0.645	18 21 41.7	27.24	22 42.0
8	20 35 23.67	11.940	19 48 49.4	70.27	1 26.8	8	19 52 40.13	1.877	18 32 4.6	24.65	22 39.0
9	20 39 59.27	11.007	19 20 36.4	70.70	1 27.4	9	19 53 39.10	3.024	18 41 23.8	21.94	22 36.5
10	20 44 11.08	9.956	18 52 21.3	70.43	1 27.6	10	19 55 4.59	4.086	18 49 36.6	19.12	22 34.4
11	20 47 56.14	+8.777	-18 24 21.8	+69.38	1 27.4	11	19 56 54.58	+5.066	-18 56 40.6	-16.21	22 32.6
12	20 51 11.32	7.465	17 56 57.9	67.46	1 26.7	12	19 59 7.15	5.968	19 2 33.9	13.23	22 31.2
13	20 53 53.39	6.018	17 30 31.0	64.61	1 25.5	13	20 1 40.46	6.795	19 7 15.2	10.20	22 30.1
14	20 55 59.12	4.437	17 5 24.0	60.79	1 23.6	14	20 4 32.76	7.552	19 10 42.9	7.11	22 29.3
15	20 57 25.40	2.733	16 42 0.7	55.97	1 21.0	15	20 7 42.43	8.244	19 12 56.1	3.98	22 28.8
16	20 58 9.44	+0.921	-16 20 45.2	+50.15	1 17.8	16	20 11 7.98	+8.876	-19 13 53.8	-0.81	22 28.5
17	20 58 8.96	-0.972	16 2 0.7	43.40	1 13.8	17	20 14 48.04	9.454	19 13 35.3	+2.37	22 28.4
18	20 57 22.45	2.908	15 46 7.9	35.86	1 9.1	18	20 18 41.35	9.981	19 11 59.9	5.58	22 28.5
19	20 55 49.41	4.840	15 33 24.5	27.67	1 3.6	19	20 22 46.77	10.463	19 9 7.1	8.82	22 28.9
20	20 53 30.66	6.707	15 24 3.7	19.04	0 57.3	20	20 27 3.26	10.904	19 4 56.4	12.07	22 29.4
21	20 50 28.50	-8.446	-15 18 12.3	+10.25	0 50.4	21	20 31 29.86	+11.307	-18 59 27.5	+15.34	22 30.0
22	20 46 46.81	9.988	15 15 50.9	+1.58	0 42.8	22	20 36 5.72	11.676	18 52 40.2	18.61	22 30.8
23	20 42 31.14	11.267	15 16 52.9	-6.66	0 34.6	23	20 40 50.06	12.014	18 44 34.3	21.89	22 31.7
24	20 37 48.51	12.228	15 21 4.7	14.20	0 26.0	24	20 45 42.16	12.324	18 35 9.7	25.17	22 32.7
25	20 32 47.07	12.828	15 28 7.0	20.82	0 17.0	25	20 50 41.39	12.608	18 24 26.3	28.45	22 33.9
26	20 27 35.71	-13.053	-15 37 35.8	-26.38	0 7.9	26	20 55 47.16	+12.869	-18 12 24.0	+31.73	22 35.2
27	20 22 23.52	12.902	15 49 4.7	30.81	23 49.9	27	21 0 58.95	13.110	17 59 3.0	35.01	22 36.5
28	20 17 19.21	12.402	16 2 6.3	34.12	23 41.2	28	21 6 16.29	13.332	17 44 23.4	38.29	22 37.9
29	20 12 30.67	11.596	16 16 14.1	36.36	23 32.9	29	21 11 38.76	13.537	17 28 25.2	41.56	22 39.4
30	20 8 4.61	10.539	16 31 3.7	37.64	23 25.0	30	21 17 5.97	13.728	17 11 8.5	44.83	22 41.0
31	20 4 6.32	-9.291	-16 46 13.5	-38.07	23 17.6	31	21 22 37.58	+13.905	-16 52 33.5	+48.09	22 42.7
32	20 0 39.68	-7.911	-17 1 25.0	-37.79	23 10.8	32	21 28 13.28	+14.069	-16 32 40.4	+51.34	22 44.4
Day of the Month.	0.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.			
Semidiameter.	"	"	"	"	"	"	"	Semidiameter . . . .	4.65	4.21	3.81
Hor. Parallax.	7.25	3.02	3.40	3.94	4.56	5.02	5.01	Horizontal Parallax . .	12.27	11.09	10.03
		7.94	8.95	10.37	12.03	13.22	13.21			9.18	8.51

NOTE.—The sign + indicates north declinations; the sign - indicates south declinations.

## GREENWICH MEAN TIME.

MARCH.						APRIL.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.			
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.				
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m			
1	21 11 38.76	+13.537	-17 28 25.2	+41.56	22 39.4	1	0 25 22.87	+17.746	+1 5 25.8	+132.97	23 52.7			
2	21 17 5.97	13.728	17 11 8.5	44.83	22 41.0	2	0 32 30.88	17.921	1 59 0.5	134.89	23 56.0			
3	21 22 37.58	13.905	16 52 33.5	48.09	22 42.7	3	0 39 43.10	18.097	2 53 18.6	136.59	23 59.3			
4	21 28 13.28	14.069	16 32 40.4	51.34	22 44.4	4	0 46 59.52	18.271	3 48 14.6	138.05	. . .			
5	21 33 52.81	14.223	16 11 29.5	54.57	22 46.2	5	0 54 20.06	18.440	4 43 42.4	139.23	0 2.7			
6	21 39 35.92	+14.366	-15 49 0.9	+57.80	22 48.0	6	1 1 44.58	+18.602	+5 39 34.9	+140.10	0 6.2			
7	21 45 22.41	14.503	15 25 14.9	61.02	22 49.9	7	1 9 12.89	18.753	6 35 44.3	140.63	0 9.7			
8	21 51 12.10	14.633	15 0 11.9	64.23	22 51.8	8	1 16 44.66	18.890	7 32 1.7	140.76	0 13.3			
9	21 57 4.82	14.760	14 33 52.2	67.41	22 53.8	9	1 24 19.46	19.007	8 28 17.1	140.46	0 17.0			
10	22 3 0.44	14.879	14 6 16.0	70.59	22 55.8	10	1 31 56.78	19.100	9 24 19.9	139.70	0 20.7			
11	22 8 58.87	+14.993	-13 37 23.6	+73.76	22 57.9	11	1 39 36.00	+19.164	+10 19 58.4	+138.43	0 24.4			
12	22 15 0.02	15.102	13 7 15.4	76.90	23 0.0	12	1 47 16.36	19.194	11 15 0.5	136.65	0 28.1			
13	22 21 3.81	15.211	12 35 52.0	80.04	23 2.2	13	1 54 56.99	19.185	12 9 13.5	134.34	0 31.9			
14	22 27 10.20	15.320	12 3 13.6	83.16	23 4.4	14	2 2 36.91	19.133	13 2 24.3	131.47	0 35.6			
15	22 33 19.18	15.428	11 29 20.6	86.25	23 6.6	15	2 10 15.04	19.036	13 54 19.8	128.07	0 39.3			
16	22 39 30.74	+15.536	-10 54 13.4	+89.33	23 8.9	16	2 17 50.24	+18.889	+14 44 47.5	+124.15	0 42.9			
17	22 45 44.90	15.645	10 17 52.6	92.39	23 11.3	17	2 25 21.31	18.692	15 33 35.4	119.76	0 46.5			
18	22 52 1.70	15.756	9 40 18.6	95.43	23 13.7	18	2 32 47.01	18.442	16 20 32.3	114.92	0 50.0			
19	22 58 21.17	15.868	9 1 32.1	98.44	23 16.1	19	2 40 6.11	18.141	17 5 28.4	109.69	0 53.3			
20	23 4 43.38	15.987	8 21 33.5	101.43	23 18.6	20	2 47 17.37	17.789	17 48 15.0	104.13	0 56.6			
21	23 11 8.42	+16.104	-7 40 23.6	+104.39	23 21.1	21	2 54 19.60	+17.389	+18 28 44.6	+98.29	0 59.7			
22	23 17 36.39	16.228	6 58 3.1	107.31	23 23.7	22	3 1 11.65	16.941	19 6 51.4	92.24	1 2.7			
23	23 24 7.38	16.356	6 14 32.9	110.20	23 26.3	23	3 7 52.41	16.449	19 42 31.1	86.04	1 5.4			
24	23 30 41.50	16.489	5 29 53.9	113.04	23 29.0	24	3 14 20.87	15.916	20 15 40.6	79.74	1 7.9			
25	23 37 18.88	16.627	4 44 7.3	115.83	23 31.7	25	3 20 36.08	15.345	20 46 17.9	73.38	1 10.2			
26	23 43 59.66	+16.770	-3 57 14.5	+118.56	23 34.5	26	3 26 37.14	+14.738	+21 14 22.4	+67.00	1 12.3			
27	23 50 43.96	16.921	3 9 17.1	121.23	23 37.4	27	3 32 23.22	14.097	21 39 54.3	60.66	1 14.1			
28	23 57 31.93	17.077	2 20 16.7	123.81	23 40.3	28	3 37 53.55	13.425	22 2 54.3	54.36	1 15.6			
29	0 4 23.68	17.237	1 30 15.4	126.29	23 43.3	29	3 43 7.41	12.725	22 23 24.0	48.13	1 16.9			
30	0 11 19.35	17.403	-0 39 15.8	128.66	23 46.4	30	3 48 4.13	11.997	22 41 25.3	42.00	1 17.9			
31	0 18 19.05	+17.573	+0 12 39.1	+130.89	23 49.5	31	3 52 43.06	+11.243	+22 57 0.6	+35.96	1 18.6			
32	0 25 22.87	+17.746	+1 5 25.8	+132.97	23 52.7	32	3 57 3.63	+10.466	+23 10 12.3	+30.03	1 19.0			
Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	"	"	"	"	"	"	"		"	"	"	"	"	"
Semidiameter.	3.02	2.86	2.74	2.63	2.55	2.51	2.48	Semidiameter	2.49	2.56	2.70	2.94	3.28	3.72
Hor. Parallax.	7.97	7.55	7.21	6.94	6.73	6.60	6.53	Hor. Parallax	6.57	6.75	7.13	7.75	8.64	9.80

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	3 52 43.06	+ 11.243	+ 22 57 0.6	+ 35.96	1 18.6	1	3 54 53.84	- 3.401	+ 16 58 23.6	- 38.45	23 13.5
2	3 57 3.63	10.466	23 10 12.3	30.03	1 19.0	2	3 53 38.80	2.845	16 43 56.0	33.80	23 8.5
3	4 1 5.28	9.668	23 21 3.0	24.21	1 19.1	3	3 52 37.66	2.244	16 31 23.4	28.88	23 3.8
4	4 4 47.51	8.849	23 29 35.4	18.50	1 18.8	4	3 51 51.39	1.606	16 20 51.3	23.77	22 59.4
5	4 8 9.85	8.010	23 35 52.1	12.91	1 18.2	5	3 51 20.79	0.940	16 12 23.5	18.53	22 55.2
6	4 11 11.87	+ 7.156	+ 23 39 55.8	+ 7.43	1 17.3	6	3 51 6.46	- 0.251	+ 16 6 2.4	- 13.22	22 51.3
7	4 13 53.21	6.288	23 41 49.2	+ 2.05	1 16.0	7	3 51 8.86	+ 0.453	16 1 48.7	7.92	22 47.7
8	4 16 13.57	5.408	23 41 34.7	- 3.23	1 14.4	8	3 51 28.30	1.168	15 59 41.8	- 2.67	22 44.3
9	4 18 12.72	4.590	23 39 15.0	8.40	1 12.4	9	3 52 4.99	1.890	15 59 39.9	+ 2.49	22 41.2
10	4 19 50.53	3.629	23 34 52.8	13.44	1 10.1	10	3 52 59.02	2.613	16 1 40.3	7.52	22 38.5
11	4 21 6.99	+ 2.741	+ 23 28 30.9	- 18.36	1 7.4	11	3 54 10.43	+ 3.337	+ 16 5 39.3	+ 12.37	22 36.1
12	4 22 2.19	1.860	23 20 12.4	23.15	1 4.4	12	3 55 39.19	4.060	16 11 32.3	17.02	22 33.9
13	4 22 36.40	0.993	23 10 0.6	27.79	1 1.0	13	3 57 25.26	4.778	16 19 14.2	21.44	22 32.0
14	4 22 50.04	+ 0.147	22 57 59.6	32.25	0 57.3	14	3 59 28.53	5.492	16 28 39.6	25.63	22 30.4
15	4 22 43.71	- 0.669	22 44 13.9	36.51	0 53.3	15	4 1 48.87	6.201	16 39 42.6	29.57	22 29.1
16	4 22 18.22	- 1.448	+ 22 28 48.7	- 40.53	0 48.9	16	4 4 26.17	+ 6.906	+ 16 52 16.8	+ 33.23	22 28.0
17	4 21 34.60	2.179	22 11 50.5	44.26	0 44.2	17	4 7 20.31	7.605	17 6 15.4	36.61	22 27.2
18	4 20 34.09	2.854	21 53 26.7	47.66	0 39.3	18	4 10 31.18	8.300	17 21 31.8	39.70	22 26.7
19	4 19 18.14	3.463	21 33 45.9	50.67	0 34.1	19	4 13 58.68	8.992	17 37 58.8	42.49	22 26.5
20	4 17 48.43	3.999	21 12 58.1	53.24	0 28.6	20	4 17 42.76	9.681	17 55 29.0	44.97	22 26.5
21	4 16 6.82	- 4.453	+ 20 51 14.4	- 55.31	0 23.0	21	4 21 43.35	+ 10.367	+ 18 13 54.9	+ 47.13	22 26.8
22	4 14 15.36	4.819	20 28 47.3	56.84	0 17.2	22	4 26 0.41	11.053	18 33 8.9	48.97	22 27.4
23	4 12 16.23	5.092	20 5 50.6	57.79	0 11.3	23	4 30 33.93	11.740	18 53 3.0	50.47	22 28.3
24	4 10 11.70	5.269	19 42 38.9	58.11	0 5.3	24	4 35 23.91	12.427	19 13 28.9	51.62	22 29.5
25	4 8 4.12	5.347	19 19 27.2	57.78	23 53.2	25	4 40 30.38	13.114	19 34 18.2	52.42	22 30.9
26	4 5 55.84	- 5.327	+ 18 56 31.2	- 56.79	23 47.2	26	4 45 53.35	+ 13.802	+ 19 55 22.1	+ 52.84	22 32.6
27	4 3 49.18	5.212	18 34 6.8	55.15	23 41.3	27	4 51 32.85	14.491	20 16 31.4	52.87	22 34.6
28	4 1 46.38	5.006	18 12 29.2	52.89	23 35.4	28	4 57 28.90	15.181	20 37 36.5	52.50	22 36.8
29	3 59 49.57	4.714	17 51 53.1	50.03	23 29.7	29	5 3 41.51	15.870	20 58 27.4	51.69	22 39.3
30	3 58 0.72	4.344	17 32 32.1	46.63	23 24.1	30	5 10 10.63	16.557	21 18 53.8	50.44	22 42.1
31	3 56 21.61	- 3.904	+ 17 14 38.7	- 42.74	23 18.7	31	5 16 56.17	+ 17.238	+ 21 38 44.7	+ 48.73	22 45.2
32	3 54 53.84	- 3.401	+ 16 58 23.6	- 38.45	23 13.5	32	5 23 57.97	+ 17.911	+ 21 57 49.0	+ 46.55	22 48.6
Day of the Month.						Day of the Month.					
Semidiameter						Semidiameter					
Hor. Parallax						Hor. Parallax					
4.25 4.82 5.40 5.86 6.07 5.98						5.63 5.13 4.60 4.09 3.64 3.26					
11.19 12.73 14.23 15.43 16.00 15.76						14.84 13.53 12.12 10.78 9.59 8.58					

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	5 16 56.17	+ 17.238	+ 21 38 44.7	+ 48.73	22 45.2	1	9 38 22.45	+ 17.800	+ 15 45 58.6	- 98.30	1 1.7
2	5 23 57.97	17.911	21 57 49.0	46.55	22 48.6	2	9 45 24.86	17.402	15 6 19.0	99.95	1 4.8
3	5 31 15.79	18.572	22 15 55.1	43.88	22 52.2	3	9 52 17.82	17.013	14 26 2.7	101.36	1 7.7
4	5 38 49.27	19.215	22 32 51.0	40.70	22 56.1	4	9 59 1.57	16.633	13 45 15.3	102.55	1 10.5
5	5 46 37.93	19.835	22 48 24.5	37.01	23 0.2	5	10 5 36.32	16.263	13 4 1.9	103.53	1 13.1
6	5 54 41.15	+ 20.426	+ 23 2 23.4	+ 32.82	23 4.5	6	10 12 2.30	+ 15.903	+ 12 22 27.4	- 104.31	1 15.6
7	6 2 58.12	20.981	23 14 35.8	28.14	23 9.1	7	10 18 19.74	15.553	11 40 36.3	104.91	1 17.9
8	6 11 27.88	21.492	23 24 50.4	23.00	23 13.8	8	10 24 28.88	15.211	10 58 32.9	105.34	1 20.1
9	6 20 9.28	21.950	23 32 56.4	17.42	23 18.7	9	10 30 29.93	14.878	10 16 21.3	105.60	1 22.2
10	6 29 1.00	22.350	23 38 43.5	11.44	23 23.8	10	10 36 23.08	14.553	9 34 5.4	105.71	1 24.1
11	6 38 1.56	+ 22.686	+ 23 42 3.0	+ 5.14	23 29.0	11	10 42 8.54	+ 14.236	+ 8 51 48.6	- 105.67	1 25.9
12	6 47 9.34	22.952	23 42 48.0	- 1.43	23 34.3	12	10 47 46.48	13.926	8 9 34.4	105.49	1 27.6
13	6 56 22.66	23.146	23 40 53.0	8.19	23 39.7	13	10 53 17.05	13.622	7 27 26.3	105.17	1 29.2
14	7 5 39.74	23.265	23 36 14.3	15.05	23 45.1	14	10 58 40.38	13.323	6 45 27.4	104.72	1 30.7
15	7 14 58.76	23.309	23 28 50.3	21.93	23 50.5	15	11 3 56.60	13.029	6 3 40.5	104.15	1 32.0
16	7 24 17.97	+ 23.281	+ 23 18 41.6	- 28.77	23 55.9	16	11 9 5.79	+ 12.738	+ 5 22 9.0	- 103.45	1 33.2
17	7 33 35.68	23.186	23 5 50.3	35.48	.	17	11 14 8.03	12.450	4 40 55.8	102.63	1 34.3
18	7 42 50.33	23.027	22 50 20.2	41.99	0 1.2	18	11 19 3.37	12.162	4 0 3.7	101.68	1 35.3
19	7 52 0.48	22.811	22 32 16.8	48.25	0 6.4	19	11 23 51.82	11.875	3 19 35.8	100.61	1 36.1
20	8 1 4.84	22.546	22 11 46.7	54.21	0 11.6	20	11 28 33.38	11.587	2 39 35.1	99.42	1 36.8
21	8 10 2.32	+ 22.239	+ 21 48 57.6	- 59.83	0 16.6	21	11 33 8.01	+ 11.298	+ 2 0 4.5	- 98.11	1 37.4
22	8 18 51.99	21.897	21 23 57.7	65.10	0 21.5	22	11 37 35.65	11.005	1 21 7.0	96.66	1 37.9
23	8 27 33.10	21.527	20 56 55.7	70.00	0 26.3	23	11 41 56.18	10.707	0 42 45.8	95.08	1 38.3
24	8 36 5.06	21.135	20 28 0.6	74.53	0 30.9	24	11 46 9.48	10.401	+ 0 5 4.1	93.37	1 38.6
25	8 44 27.42	20.728	19 57 21.4	78.68	0 35.3	25	11 50 15.37	10.088	- 0 31 54.6	91.51	1 38.8
26	8 52 39.89	+ 20.311	+ 19 25 6.8	- 82.47	0 39.6	26	11 54 13.65	+ 9.766	- 1 8 6.9	- 89.49	1 38.8
27	9 0 42.28	19.888	18 51 25.5	85.90	0 43.7	27	11 58 4.05	9.432	1 43 28.9	87.31	1 38.7
28	9 8 34.50	19.464	18 16 26.1	89.00	0 47.6	28	12 1 46.26	9.084	2 17 56.6	84.96	1 38.4
29	9 16 16.54	19.041	17 40 16.4	91.77	0 51.4	29	12 5 19.94	8.720	2 51 25.6	82.42	1 38.0
30	9 23 48.46	18.621	17 3 3.9	94.23	0 55.0	30	12 8 44.67	8.338	3 23 51.4	79.69	1 37.5
31	9 31 10.38	+ 18.207	+ 16 24 55.7	- 96.40	0 58.4	31	12 11 59.98	+ 7.935	- 3 55 8.9	- 76.73	1 36.8
32	9 38 22.45	+ 17.800	+ 15 45 58.6	- 98.30	1 1.7	32	12 15 5.35	+ 7.508	- 4 25 12.6	- 73.53	1 35.9
Day of the Month.						Day of the Month.					
4th. 9th. 14th. 19th. 24th. 29th.						2d. 8th. 13th. 18th. 23d. 28th.					
Semidiameter						Semidiameter					
Hor. Parallax						Hor. Parallax					
2.95 2.72 2.57 2.50 2.50 2.54						2.61 2.71 2.84 3.00 3.20 3.44					
7.77 7.16 6.78 6.59 6.58 6.68						6.88 7.16 7.50 7.92 8.43 9.05					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	12 15 5.35	+ 7.508	- 4 25 12.6	- 73.53	1 35.9	1	11 49 21.41	- 4.647	+ 0 5 13.9	+ 85.44	23 6.7
2	12 18 0.19	7.057	4 53 56.5	70.08	1 34.9	2	11 47 46.32	3.258	0 37 24.5	75.18	23 1.7
3	12 20 43.85	6.577	5 21 14.3	66.35	1 33.7	3	11 46 45.78	1.775	1 5 11.6	63.55	22 57.3
4	12 23 15.60	6.064	5 46 58.8	62.31	1 32.2	4	11 46 21.54	- 0.239	1 28 7.1	50.93	22 53.5
5	12 25 34.64	5.517	6 11 2.4	57.93	1 30.6	5	11 46 34.40	+ 1.310	1 45 51.9	37.71	22 50.4
6	12 27 40.12	+ 4.933	- 6 33 16.6	- 53.18	1 28.8	6	11 47 24.24	+ 2.837	+ 1 58 15.8	+ 24.25	22 47.9
7	12 29 31.10	4.309	6 53 32.2	48.04	1 26.7	7	11 48 50.18	4.313	2 5 16.6	+ 10.84	22 45.9
8	12 31 6.59	3.642	7 11 39.2	42.46	1 24.3	8	11 50 50.70	5.715	2 6 58.9	- 2.25	22 44.5
9	12 32 25.55	2.931	7 27 26.9	36.42	1 21.6	9	11 53 23.74	7.022	2 3 32.8	14.80	22 43.6
10	12 33 26.90	2.174	7 40 43.6	29.89	1 18.7	10	11 56 26.89	8.222	1 55 13.5	26.66	22 43.2
11	12 34 9.55	+ 1.372	- 7 51 17.1	- 22.82	1 15.5	11	11 59 57.51	+ 9.309	+ 1 42 19.6	- 37.69	22 43.2
12	12 34 32.41	+ 0.525	7 58 54.4	15.19	1 11.9	12	12 3 52.83	10.281	1 25 11.8	47.81	22 43.5
13	12 34 34.41	- 0.364	8 3 21.9	- 6.98	1 8.0	13	12 8 10.07	11.138	1 4 12.5	56.97	22 44.1
14	12 34 14.61	1.291	8 4 25.7	+ 1.79	1 3.7	14	12 12 46.53	11.884	0 39 44.8	65.17	22 45.0
15	12 33 32.21	2.247	8 1 52.3	11.10	0 59.0	15	12 17 39.66	12.527	+ 0 12 11.7	72.43	22 46.2
16	12 32 26.63	- 3.220	- 7 55 29.0	+ 20.91	0 54.0	16	12 22 47.08	+ 13.075	- 0 18 4.4	- 78.77	22 47.6
17	12 30 57.62	4.197	7 45 4.8	31.15	0 48.6	17	12 28 6.62	13.538	0 50 42.0	84.23	22 49.1
18	12 29 5.32	5.158	7 30 30.8	41.71	0 42.8	18	12 33 36.32	13.925	1 25 20.7	88.87	22 50.8
19	12 26 50.39	6.079	7 11 41.7	52.39	0 36.6	19	12 39 14.50	14.246	2 1 41.7	92.76	22 52.6
20	12 24 14.09	6.933	6 48 37.4	62.94	0 30.1	20	12 44 59.68	14.509	2 39 27.9	95.97	22 54.5
21	12 21 18.38	- 7.690	- 6 21 23.9	+ 73.11	0 23.3	21	12 50 50.56	+ 14.743	- 3 18 23.4	- 98.55	22 56.5
22	12 18 5.96	8.319	5 50 14.1	82.56	0 16.2	22	12 56 46.07	14.896	3 58 14.0	100.57	22 58.6
23	12 14 40.32	8.787	5 15 29.8	90.91	0 8.8	23	13 2 45.31	15.035	4 38 47.0	102.10	23 0.7
24	12 11 5.72	9.063	4 37 42.0	97.80	0 1.3	24	13 8 47.52	15.145	5 19 51.1	103.18	23 2.8
25	12 7 27.05	9.121	3 57 29.8	102.88	23 46.3	25	13 14 52.08	15.232	6 1 16.1	103.85	23 5.0
26	12 3 49.74	- 8.945	- 3 15 40.3	+ 105.85	23 38.8	26	13 20 58.50	+ 15.300	- 6 42 53.0	- 104.17	23 7.2
27	12 0 19.53	8.529	2 33 7.3	106.49	23 31.6	27	13 27 6.39	15.354	7 24 33.8	104.19	23 9.4
28	11 57 2.23	7.873	1 50 48.1	104.70	23 24.7	28	13 33 15.42	15.397	8 6 11.7	103.93	23 11.6
29	11 54 3.44	6.990	1 9 41.1	100.48	23 18.2	29	13 39 25.36	15.431	8 47 40.5	103.43	23 13.8
30	11 51 28.33	5.904	- 0 30 43.1	93.97	23 12.2	30	13 45 36.04	15.459	9 28 54.7	102.72	23 16.0
31	11 49 21.41	- 4.647	+ 0 5 13.9	+ 85.44	23 6.7	31	13 51 47.34	+ 15.482	- 10 9 49.5	- 101.82	23 18.3
32	11 47 46.32	- 3.258	+ 0 37 24.5	+ 75.18	23 1.7	32	13 57 59.17	+ 15.504	- 10 50 20.6	- 100.74	23 20.6
Day of the Month.						Day of the Month.					
2d. 7th. 12th. 17th. 22d. 27th.						2d. 7th. 12th. 17th. 22d. 27th.					
Semidiameter . . .						Semidiameter . . .					
Hor. Parallax . . .						Hor. Parallax . . .					
3.72 4.06 4.46 4.86 5.13 5.05						4.58 3.95 3.39 2.98 2.71 2.54					
9.80 10.70 11.75 12.81 13.52 13.31						12.07 10.40 8.92 7.86 7.14 6.69					

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.



## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.			
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.				
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m			
1	13 57 59.17	+ 15.504	- 10 50 20.6	- 100.74	23 20.6	1	17 10 55.64	+ 16.843	- 24 51 33.4	- 29.62	0 33.1			
2	14 4 11.51	15.524	11 30 24.1	99.52	23 22.9	2	17 17 40.26	16.874	25 2 44.5	26.30	0 35.9			
3	14 10 24.33	15.544	12 9 56.7	98.17	23 25.2	3	17 24 25.52	16.896	25 12 35.3	22.92	0 38.8			
4	14 16 37.63	15.565	12 48 55.2	96.69	23 27.5	4	17 31 11.20	16.909	25 21 4.4	19.49	0 41.6			
5	14 22 51.45	15.577	13 27 16.9	95.10	23 29.8	5	17 37 57.04	16.911	25 28 10.4	16.00	0 44.4			
6	14 29 5.82	+ 15.611	- 14 4 59.3	- 93.42	23 32.1	6	17 44 42.78	+ 16.900	- 25 33 52.1	- 12.47	0 47.2			
7	14 35 20.80	15.638	14 42 0.2	91.65	23 34.4	7	17 51 28.13	16.875	25 38 8.5	8.89	0 50.0			
8	14 41 36.45	15.667	15 18 17.5	89.79	23 36.7	8	17 58 12.70	16.834	25 40 58.4	5.26	0 52.8			
9	14 47 52.84	15.700	15 53 49.2	87.85	23 39.0	9	18 4 56.07	16.776	25 42 20.9	- 1.61	0 55.6			
10	14 54 10.04	15.735	16 28 33.6	85.83	23 41.4	10	18 11 37.79	16.698	25 42 15.3	+ 2.08	0 58.4			
11	15 0 28.13	+ 15.773	- 17 2 28.8	- 83.75	23 43.8	11	18 18 17.34	+ 16.595	- 25 40 41.0	+ 5.79	1 1.1			
12	15 6 47.18	15.815	17 35 33.2	81.61	23 46.2	12	18 24 54.13	16.466	25 37 37.5	9.50	1 3.8			
13	15 13 7.25	15.859	18 7 45.3	79.40	23 48.6	13	18 31 27.46	16.307	25 33 4.9	13.21	1 6.4			
14	15 19 28.43	15.906	18 39 3.7	77.12	23 51.0	14	18 37 56.59	16.115	25 27 3.3	16.91	1 8.9			
15	15 25 50.78	15.956	19 9 26.9	74.79	23 53.5	15	18 44 20.69	15.886	25 19 33.2	20.58	1 11.4			
16	15 32 14.36	+ 16.009	- 19 38 53.5	- 72.40	23 56.0	16	18 50 38.78	+ 15.613	- 25 10 35.8	+ 24.19	1 13.8			
17	15 38 39.24	16.065	20 7 22.0	69.96	23 58.5	17	18 56 49.75	15.292	25 0 12.6	27.73	1 16.0			
18	15 45 5.48	16.122	20 34 51.1	67.46	.	18	19 2 52.37	14.917	24 48 25.6	31.17	1 18.1			
19	15 51 33.11	16.181	21 1 19.3	64.89	0 1.0	19	19 8 45.25	14.480	24 35 17.6	34.47	1 20.0			
20	15 58 2.18	16.242	21 26 45.4	62.27	0 3.5	20	19 14 26.80	13.972	24 20 52.4	37.60	1 21.8			
21	16 4 32.72	+ 16.303	- 21 51 8.1	- 59.60	0 6.1	21	19 19 55.23	+ 13.385	- 24 5 14.6	+ 40.52	1 23.3			
22	16 11 4.74	16.365	22 14 25.9	56.87	0 8.7	22	19 25 8.55	12.710	23 48 29.8	43.18	1 24.5			
23	16 17 38.24	16.427	22 36 37.4	54.08	0 11.3	23	19 30 4.51	11.937	23 30 44.7	45.53	1 25.5			
24	16 24 13.21	16.488	22 57 41.2	51.23	0 14.0	24	19 34 40.61	11.053	23 12 7.6	47.50	1 26.1			
25	16 30 49.65	16.548	23 17 36.0	48.32	0 16.7	25	19 38 54.08	10.049	22 52 48.2	49.04	1 26.4			
26	16 37 27.51	+ 16.606	- 23 36 20.2	- 45.35	0 19.4	26	19 42 41.91	+ 8.914	- 22 32 57.7	+ 50.09	1 26.2			
27	16 44 6.74	16.661	23 53 52.5	42.32	0 22.1	27	19 46 0.84	7.639	22 12 48.5	50.59	1 25.5			
28	16 50 47.27	16.714	24 10 11.4	39.23	0 24.8	28	19 48 47.42	6.217	21 52 34.8	50.46	1 24.3			
29	16 57 29.01	16.763	24 25 15.5	36.09	0 27.5	29	19 50 58.07	4.645	21 32 32.1	49.66	1 22.6			
30	17 4 11.84	16.806	24 39 3.3	32.89	0 30.3	30	19 52 29.23	2.927	21 12 56.9	48.16	1 20.2			
31	17 10 55.64	+ 16.843	- 24 51 33.4	- 29.62	0 33.1	31	19 53 17.46	+ 1.072	- 20 54 6.0	+ 45.95	1 17.0			
32	17 17 40.26	+ 16.874	- 25 2 44.5	- 26.30	0 35.9	32	19 53 19.81	- 0.895	- 20 36 16.5	+ 43.05	1 13.1			
Day of the Month.						Day of the Month.								
	1st.	6th.	11th.	16th.	21st.	26th.		1st.	6th.	11th.	16th.	21st.	26th.	31st.
	"	"	"	"	"	"		"	"	"	"	"	"	"
Semidiameter	2.43	2.36	2.32	2.31	2.32	2.35	Semidiameter	2.41	2.50	2.63	2.82	3.10	3.50	4.04
Hor. Parallax	6.40	6.21	6.11	6.07	6.10	6.19	Hor. Parallax	6.35	6.59	6.94	7.44	8.17	9.22	10.65

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

**NOTE.**—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	21 2 12.11	-1.043	8 50 55.0	-24.82	22 24.6	1	21 52 54.86	+7.698	9 56 13.7	+16.92	21 16.3
2	21 1 52.08	0.625	9 0 41.1	24.01	22 20.5	2	21 55 59.55	7.762	9 49 10.9	18.32	21 15.5
3	21 1 42.04	-0.210	9 10 6.5	23.10	22 16.5	3	21 59 7.35	7.888	9 41 34.7	19.70	21 14.7
4	21 1 41.90	+0.199	9 19 9.2	22.11	22 12.7	4	22 2 18.11	8.003	9 33 25.4	21.07	21 14.0
5	21 1 51.51	0.602	9 27 47.3	21.05	22 9.1	5	22 5 31.66	8.122	9 24 43.5	22.42	21 13.3
6	21 2 10.70	+0.997	9 35 59.1	-19.92	22 5.6	6	22 8 47.86	+8.229	9 15 29.5	+23.76	21 12.7
7	21 2 39.28	1.384	9 43 43.2	18.74	22 2.3	7	22 12 6.57	8.330	9 5 43.7	25.07	21 12.1
8	21 3 17.02	1.760	9 50 58.3	17.51	21 59.1	8	22 15 27.64	8.426	8 55 26.7	26.36	21 11.5
9	21 4 3.67	2.126	9 57 43.3	16.23	21 56.1	9	22 18 50.95	8.517	8 44 39.0	27.62	21 11.0
10	21 4 58.96	2.481	10 3 57.2	14.92	21 53.2	10	22 22 16.38	8.603	8 33 21.3	28.86	21 10.5
11	21 6 2.63	+2.825	10 9 39.1	-13.57	21 50.5	11	22 25 43.82	+8.684	8 21 34.1	+30.08	21 10.0
12	21 7 14.41	3.157	10 14 48.5	12.20	21 47.9	12	22 29 13.15	8.761	8 9 18.0	31.27	21 9.6
13	21 8 34.02	3.477	10 19 24.7	10.80	21 45.4	13	22 32 44.27	8.834	7 56 33.5	32.44	21 9.2
14	21 10 1.18	3.786	10 23 27.2	9.38	21 43.0	14	22 36 17.09	8.903	7 43 21.2	33.59	21 8.8
15	21 11 35.62	4.084	10 26 55.7	7.96	21 40.7	15	22 39 51.53	8.969	7 29 41.5	34.72	21 8.5
16	21 13 17.07	+4.370	10 29 49.8	-6.52	21 38.5	16	22 43 27.51	+9.031	7 15 35.0	+35.82	21 8.2
17	21 15 5.28	4.646	10 32 9.1	5.07	21 36.5	17	22 47 4.96	9.090	7 1 2.3	36.90	21 7.9
18	21 16 59.98	4.911	10 33 53.4	3.61	21 34.6	18	22 50 43.81	9.147	6 46 4.0	37.96	21 7.6
19	21 19 0.91	5.166	10 35 2.4	2.13	21 32.8	19	22 54 23.99	9.201	6 30 40.5	38.99	21 7.3
20	21 21 7.82	5.410	10 35 35.9	-0.65	21 31.1	20	22 58 5.45	9.253	6 14 52.5	40.01	21 7.1
21	21 23 20.47	+5.644	10 35 33.9	+0.83	21 29.4	21	23 1 48.12	+9.302	5 58 40.4	+41.00	21 6.9
22	21 25 38.62	5.868	10 34 56.2	2.31	21 27.8	22	23 5 31.95	9.350	5 42 5.0	41.96	21 6.7
23	21 28 2.06	6.083	10 33 42.8	3.80	21 26.3	23	23 9 16.90	9.396	5 25 6.8	42.90	21 6.5
24	21 30 30.55	6.289	10 31 53.9	5.29	21 24.9	24	23 13 2.91	9.440	5 7 46.4	43.81	21 6.4
25	21 33 3.87	6.486	10 29 29.5	6.77	21 23.6	25	23 16 49.95	9.482	4 50 4.4	44.70	21 6.2
26	21 35 41.80	+6.674	10 26 29.5	+8.24	21 22.4	26	23 20 37.97	+9.522	4 32 1.4	+45.56	21 6.1
27	21 38 24.12	6.853	10 22 54.1	9.71	21 21.2	27	23 24 26.93	9.560	4 13 38.1	46.39	21 6.0
28	21 41 10.63	7.023	10 18 43.5	11.17	21 20.1	28	23 28 16.81	9.597	3 54 55.0	47.20	21 5.9
29	21 44 1.15	7.186	10 13 57.9	12.63	21 19.1	29	23 32 7.56	9.633	3 35 52.9	47.98	21 5.8
30	21 46 55.48	7.342	10 8 37.5	14.07	21 18.1	30	23 35 59.16	9.667	3 16 32.3	48.73	21 5.7
31	21 49 53.45	+7.489	10 2 42.7	+15.50	21 17.2	31	23 39 51.57	+9.700	2 56 54.0	+49.46	21 5.6
32	21 52 54.86	+7.628	9 56 13.7	+16.92	21 16.3	32	23 43 44.77	+9.733	2 36 58.6	+50.16	21 5.6
Day of the Month. 2d. 7th. 12th. 17th. 22d. 27th.						Day of the Month. 1st. 6th. 11th. 16th. 21st. 26th.					
Semidiameter . . . 26.63 24.65 22.72 20.93 19.31 17.86						Semidiameter . . . 16.57 15.43 14.42 13.53 12.73 12.02					
Hor. Parallax . . . 27.43 25.38 23.40 21.56 19.88 18.39						Hor. Parallax . . . 17.06 15.89 14.85 13.93 13.10 12.37					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	23 39 51.57	+ 9.700	- 2 56 54.0	+ 49.46	21 5.6	1	1 45 43.31	+ 10.638	+ 8 35 26.8	+ 57.65	21 9.6
2	23 43 44.77	9.733	2 36 58.6	50.16	21 5.6	2	1 49 59.05	10.675	8 58 28.0	57.45	21 9.9
3	23 47 38.73	9.764	2 16 46.8	50.83	21 5.6	3	1 54 15.69	10.713	9 21 24.1	57.22	21 10.3
4	23 51 33.44	9.793	1 56 19.3	51.47	21 5.6	4	1 58 33.25	10.752	9 44 14.4	56.96	21 10.7
5	23 55 28.86	9.822	1 35 36.8	52.08	21 5.6	5	2 2 51.75	10.791	10 6 58.1	56.67	21 11.1
6	23 59 24.99	+ 9.850	- 1 14 40.1	+ 52.66	21 5.6	6	2 7 11.19	+ 10.831	+ 10 29 34.5	+ 56.35	21 11.5
7	0 3 21.80	9.879	0 53 29.8	53.21	21 5.6	7	2 11 31.60	10.871	10 52 2.9	56.00	21 11.9
8	0 7 19.29	9.908	0 32 6.6	53.73	21 5.6	8	2 15 52.98	10.912	11 14 22.5	55.62	21 12.3
9	0 11 17.43	9.936	- 0 10 31.4	54.22	21 5.6	9	2 20 15.34	10.953	11 36 32.6	55.21	21 12.8
10	0 15 16.22	9.963	+ 0 11 15.2	54.68	21 5.7	10	2 24 38.70	10.995	11 58 32.5	54.77	21 13.2
11	0 19 15.64	+ 9.990	+ 0 33 12.5	+ 55.11	21 5.7	11	2 29 3.08	+ 11.038	+ 12 20 21.4	+ 54.30	21 13.7
12	0 23 15.70	10.016	0 55 19.7	55.51	21 5.8	12	2 33 28.49	11.081	12 41 58.7	53.80	21 14.2
13	0 27 16.39	10.043	1 17 36.3	55.88	21 5.9	13	2 37 54.95	11.125	13 3 23.7	53.27	21 14.7
14	0 31 17.73	10.070	1 40 1.5	56.22	21 6.0	14	2 42 22.47	11.169	13 24 35.7	52.71	21 15.2
15	0 35 19.71	10.097	2 2 34.7	56.54	21 6.1	15	2 46 51.08	11.214	13 45 33.9	52.13	21 15.8
16	0 39 22.35	+ 10.124	+ 2 25 15.1	+ 56.83	21 6.2	16	2 51 20.79	+ 11.259	+ 14 6 17.7	+ 51.52	21 16.3
17	0 43 25.65	10.152	2 48 2.1	57.09	21 6.3	17	2 55 51.60	11.305	14 26 46.4	50.87	21 16.9
18	0 47 29.62	10.181	3 10 55.1	57.33	21 6.4	18	3 0 23.54	11.352	14 46 59.4	50.19	21 17.5
19	0 51 34.27	10.209	3 33 53.4	57.53	21 6.6	19	3 4 56.62	11.400	15 6 55.9	49.49	21 18.2
20	0 55 39.62	10.238	3 56 56.3	57.71	21 6.8	20	3 9 30.85	11.449	15 26 35.2	48.76	21 18.8
21	0 59 45.67	+ 10.269	+ 4 20 3.2	+ 57.86	21 6.9	21	3 14 6.24	+ 11.499	+ 15 45 56.6	+ 48.00	21 19.5
22	1 3 52.45	10.298	4 43 13.4	57.99	21 7.1	22	3 18 42.80	11.548	16 4 59.4	47.21	21 20.2
23	1 7 59.96	10.329	5 6 26.2	58.08	21 7.3	23	3 23 20.54	11.598	16 23 43.0	46.40	21 20.9
24	1 12 8.23	10.360	5 29 41.0	58.15	21 7.5	24	3 27 59.47	11.647	16 42 6.6	45.55	21 21.6
25	1 16 17.26	10.392	5 52 57.0	58.19	21 7.7	25	3 32 39.58	11.697	17 0 9.6	44.68	21 22.3
26	1 20 27.08	+ 10.425	+ 6 16 13.6	+ 58.20	21 8.0	26	3 37 20.90	+ 11.747	+ 17 17 51.3	+ 43.78	21 23.1
27	1 24 37.69	10.459	6 39 30.1	58.18	21 8.2	27	3 42 3.41	11.797	17 35 10.9	42.85	21 23.9
28	1 28 49.12	10.494	7 2 45.9	58.13	21 8.5	28	3 46 47.13	11.847	17 52 7.9	41.89	21 24.7
29	1 33 1.38	10.529	7 26 0.2	58.05	21 8.7	29	3 51 32.04	11.897	18 8 41.5	40.90	21 25.5
30	1 37 14.49	10.565	7 49 12.2	57.95	21 9.0	30	3 56 18.15	11.947	18 24 51.0	39.88	21 26.3
31	1 41 28.46	+ 10.601	+ 8 12 21.3	+ 57.82	21 9.3	31	4 1 5.44	+ 11.996	+ 18 40 35.7	+ 38.84	21 27.2
32	1 45 43.31	+ 10.638	+ 8 35 26.8	+ 57.65	21 9.6	32	4 5 53.90	+ 12.045	+ 18 55 55.0	+ 37.76	21 28.1
Day of the Month. 1st. 6th. 11th. 16th. 21st. 26th. 31st.						Day of the Month. 5th. 10th. 15th. 20th. 25th. 30th.					
Semidiameter . 11.38 10.81 10.29 9.82 9.40 9.02 8.67						Semidiameter . . 8.35 8.06 7.79 7.54 7.32 7.11					
Hor. Parallax . 11.72 11.13 10.60 10.12 9.68 9.29 8.93						Hor. Parallax . . 8.60 8.30 8.02 7.77 7.54 7.32					

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	4 1 5.44	+11.996	+18 40 35.7	+38.84	21 27.2	1	6 37 17.39	+12.972	+22 31 58.0	-4.35	22 1.5
2	4 5 53.90	12.045	18 55 55.0	37.76	21 28.1	2	6 42 28.77	12.976	22 29 54.7	5.95	22 2.8
3	4 10 43.52	12.093	19 10 48.2	36.66	21 29.0	3	6 47 40.21	12.976	22 27 13.0	7.55	22 4.0
4	4 15 34.28	12.140	19 25 14.6	35.53	21 29.9	4	6 52 51.67	12.977	22 23 53.0	9.15	22 5.3
5	4 20 26.18	12.187	19 39 13.6	34.37	21 30.9	5	6 58 3.09	12.975	22 19 54.6	10.75	22 6.5
6	4 25 19.19	+12.233	+19 52 44.5	+33.19	21 31.8	6	7 3 14.42	+12.970	+22 15 17.9	-12.34	22 7.8
7	4 30 13.29	12.278	20 5 46.8	31.98	21 32.8	7	7 8 25.60	12.963	22 10 3.0	13.93	22 9.0
8	4 35 8.47	12.322	20 18 19.8	30.75	21 33.8	8	7 13 36.60	12.954	22 4 9.9	15.52	22 10.3
9	4 40 4.69	12.365	20 30 22.9	29.49	21 34.8	9	7 18 47.36	12.943	21 57 38.8	17.10	22 11.5
10	4 45 1.93	12.407	20 41 55.6	28.21	21 35.8	10	7 23 57.83	12.930	21 50 29.8	18.68	22 12.8
11	4 50 0.18	+12.448	+20 52 57.2	+26.91	21 36.9	11	7 29 7.97	+12.915	+21 42 43.1	-20.25	22 14.0
12	4 54 59.40	12.488	21 3 27.3	25.59	21 37.9	12	7 34 17.74	12.899	21 34 19.0	21.80	22 15.2
13	4 59 59.57	12.527	21 13 25.3	24.24	21 39.0	13	7 39 27.09	12.881	21 25 17.6	23.34	22 16.4
14	5 5 0.66	12.565	21 22 50.8	22.87	21 40.1	14	7 44 35.99	12.861	21 15 39.1	24.88	22 17.6
15	5 10 2.65	12.601	21 31 43.2	21.48	21 41.2	15	7 49 44.39	12.840	21 5 23.9	26.41	22 18.8
16	5 15 5.50	+12.636	+21 40 2.1	+20.07	21 42.3	16	7 54 52.27	+12.817	+20 54 32.2	-27.92	22 20.0
17	5 20 9.18	12.670	21 47 47.1	18.65	21 43.5	17	7 59 59.58	12.793	20 43 4.4	29.42	22 21.2
18	5 25 13.65	12.703	21 54 57.6	17.21	21 44.6	18	8 5 6.29	12.767	20 31 0.8	30.90	22 22.3
19	5 30 18.88	12.734	22 1 33.3	15.75	21 45.8	19	8 10 12.38	12.740	20 18 21.8	32.37	22 23.5
20	5 35 24.83	12.763	22 7 33.7	14.28	21 46.9	20	8 15 17.81	12.712	20 5 7.8	33.82	22 24.6
21	5 40 31.46	+12.791	+22 12 58.6	+12.79	21 48.1	21	8 20 22.56	+12.683	+19 51 19.1	-35.26	22 25.7
22	5 45 38.74	12.817	22 17 47.5	11.28	21 49.3	22	8 25 26.60	12.653	19 36 56.1	36.68	22 26.8
23	5 50 46.62	12.841	22 22 0.2	9.76	21 50.5	23	8 30 29.91	12.622	19 21 59.2	38.08	22 27.9
24	5 55 55.07	12.863	22 25 36.3	8.23	21 51.7	24	8 35 32.47	12.591	19 6 29.0	39.46	22 29.0
25	6 1 4.04	12.884	22 28 35.5	6.68	21 52.9	25	8 40 34.26	12.558	18 50 25.9	40.82	22 30.1
26	6 6 13.49	+12.903	+22 30 57.6	+5.13	21 54.1	26	8 45 35.26	+12.525	+18 33 50.3	-42.16	22 31.2
27	6 11 23.36	12.920	22 32 42.3	3.57	21 55.4	27	8 50 35.45	12.491	18 16 42.8	43.48	22 32.3
28	6 16 33.61	12.935	22 33 49.3	2.00	21 56.6	28	8 55 34.83	12.457	17 59 3.9	44.78	22 33.3
29	6 21 44.19	12.947	22 34 18.6	+0.42	21 57.8	29	9 0 33.37	12.422	17 40 54.1	46.05	22 34.3
30	6 26 55.05	12.957	22 34 9.9	-1.17	21 59.0	30	9 5 31.06	12.386	17 22 14.0	47.30	22 35.3
31	6 32 6.13	+12.966	+22 33 23.1	-2.76	22 0.3	31	9 10 27.89	+12.350	+17 3 4.2	-48.53	22 36.3
32	6 37 17.39	+12.972	+22 31 58.0	-4.35	22 1.5	32	9 15 23.85	+12.313	+16 43 25.2	-49.73	22 37.3
Day of the Month.						Day of the Month.					
5th. 10th. 15th. 20th. 25th. 30th.						4th. 9th. 14th. 19th. 24th. 29th.					
Semidiameter . . . 6.92 6.74 6.58 6.43 6.29 6.16						Semidiameter . . . 6.04 5.93 5.83 5.73 5.65 5.57					
Hor. Parallax . . . 7.12 6.94 6.77 6.62 6.47 6.34						Hor. Parallax . . . 6.22 6.10 6.00 5.90 5.82 5.73					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.							
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.		
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.			
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m		
1	9 15 23.85	+ 12.313	+ 16 43 25.2	- 49.73	22 37.3	1	11 37 18.00	+ 11.475	+ 4 1 53.1	- 72.92	23 0.6		
2	9 20 18.93	12.276	16 23 17.6	50.91	22 38.3	2	11 41 53.26	11.465	3 32 39.2	73.24	23 1.2		
3	9 25 13.12	12.239	16 2 42.2	52.06	22 39.2	3	11 46 28.29	11.456	3 3 18.0	73.52	23 1.8		
4	9 30 6.43	12.202	15 41 39.4	53.19	22 40.1	4	11 51 3.14	11.449	2 33 50.3	73.78	23 2.4		
5	9 34 58.85	12.166	15 20 9.9	54.29	22 41.0	5	11 55 37.83	11.443	2 4 16.9	74.01	23 3.1		
6	9 39 50.39	+ 12.129	+ 14 58 14.4	- 55.36	22 41.9	6	12 0 12.40	+ 11.439	+ 1 34 38.4	- 74.20	23 3.7		
7	9 44 41.05	12.093	14 35 53.5	56.40	22 42.8	7	12 4 46.90	11.436	1 4 55.6	74.36	23 4.4		
8	9 49 30.84	12.057	14 13 7.9	57.41	22 43.7	8	12 9 21.35	11.435	0 35 9.2	74.49	23 5.0		
9	9 54 19.77	12.021	13 49 58.2	58.40	22 44.5	9	12 13 55.80	11.436	+ 0 5 20.1	74.60	23 5.6		
10	9 59 7.85	11.986	13 26 25.1	59.36	22 45.4	10	12 18 30.28	11.438	- 0 24 31.1	74.67	23 6.2		
11	10 3 55.09	+ 11.951	+ 13 2 29.3	- 60.30	22 46.2	11	12 23 4.84	+ 11.442	- 0 54 23.6	- 74.71	23 6.9		
12	10 8 41.50	11.917	12 38 11.4	61.20	22 47.0	12	12 27 39.51	11.448	1 24 16.7	74.72	23 7.5		
13	10 13 27.10	11.884	12 13 32.2	62.08	22 47.8	13	12 32 14.34	11.455	1 54 9.6	74.69	23 8.2		
14	10 18 11.91	11.852	11 48 32.3	62.93	22 48.6	14	12 36 49.37	11.464	2 24 1.6	74.64	23 8.8		
15	10 22 55.96	11.820	11 23 12.3	63.75	22 49.4	15	12 41 24.63	11.475	2 53 52.0	74.55	23 9.5		
16	10 27 39.26	+ 11.790	+ 10 57 33.0	- 64.54	22 50.2	16	12 46 0.18	+ 11.488	- 3 23 40.0	- 74.44	23 10.1		
17	10 32 21.84	11.760	10 31 35.1	65.30	22 50.9	17	12 50 36.05	11.502	3 53 24.8	74.29	23 10.8		
18	10 37 3.72	11.732	10 5 19.2	66.03	22 51.7	18	12 55 12.29	11.518	4 23 5.8	74.12	23 11.4		
19	10 41 44.93	11.704	9 38 46.0	66.74	22 52.4	19	12 59 48.93	11.536	4 52 42.1	73.91	23 12.1		
20	10 46 25.50	11.677	9 11 56.2	67.41	22 53.1	20	13 4 26.02	11.556	5 22 13.1	73.67	23 12.8		
21	10 51 5.45	+ 11.652	+ 8 44 50.5	- 68.06	22 53.8	21	13 9 3.59	+ 11.577	- 5 51 38.0	- 73.40	23 13.5		
22	10 55 44.81	11.628	8 17 29.6	68.67	22 54.5	22	13 13 41.70	11.600	6 20 56.0	73.10	23 14.2		
23	11 0 23.62	11.606	7 49 54.2	69.26	22 55.2	23	13 18 20.38	11.625	6 50 6.4	72.76	23 14.9		
24	11 5 1.91	11.585	7 22 4.9	69.82	22 55.9	24	13 22 59.68	11.651	7 19 8.4	72.40	23 15.6		
25	11 9 39.71	11.565	6 54 2.5	70.36	22 56.6	25	13 27 39.63	11.679	7 48 1.2	72.00	23 16.4		
26	11 14 17.05	+ 11.546	+ 6 25 47.7	- 70.87	22 57.3	26	13 32 20.27	+ 11.708	- 8 16 44.1	- 71.57	23 17.1		
27	11 18 53.97	11.529	5 57 21.3	71.34	22 58.0	27	13 37 1.62	11.739	8 45 16.4	71.10	23 17.9		
28	11 23 30.49	11.513	5 28 43.9	71.78	22 58.7	28	13 41 43.73	11.771	9 13 37.1	70.60	23 18.7		
29	11 28 6.65	11.499	4 59 56.2	72.19	22 59.3	29	13 46 26.64	11.805	9 41 45.5	70.07	23 19.5		
30	11 32 42.48	11.486	4 30 59.0	72.57	23 0.0	30	13 51 10.37	11.840	10 9 40.7	69.51	23 20.3		
31	11 37 18.00	+ 11.475	+ 4 1 53.1	- 72.92	23 0.6	31	13 55 54.96	+ 11.876	- 10 37 22.0	- 68.91	23 21.1		
32	11 41 53.26	+ 11.465	+ 3 32 39.2	- 73.24	23 1.2	32	14 0 40.43	+ 11.913	- 11 4 48.5	- 68.28	23 21.9		
Day of the Month.						Day of the Month.							
	3d.	8th.	13th.	18th.	23d.	28th.		3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	5.50	5.43	5.37	5.32	5.27	5.22	Semidiameter . .	5.18	5.14	5.11	5.09	5.06	5.04
Hor. Parallax . .	5.66	5.59	5.53	5.47	5.42	5.38	Hor. Parallax . .	5.33	5.30	5.26	5.24	5.21	5.19

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	14 0 40.43	+ 11.913	- 11 4 48.5	- 68.28	23 21.9	1	16 31 57.01	+ 13.331	- 21 47 35.4	- 34.03	23 55.5
2	14 5 26.81	11.952	11 31 59.5	67.62	23 22.8	2	16 37 17.46	13.373	22 0 53.3	32.42	23 56.9
3	14 10 14.13	11.992	11 58 54.1	66.92	23 23.6	3	16 42 38.90	13.413	22 13 32.3	30.79	23 58.3
4	14 15 2.42	12.033	12 25 31.6	66.18	23 24.5	4	16 48 1.28	13.452	22 25 31.8	29.13	23 59.8
5	14 19 51.72	12.075	12 51 51.0	65.41	23 25.4	5	16 53 24.57	13.489	22 36 51.2	27.45	. . . .
6	14 24 42.05	+ 12.119	- 13 17 51.6	- 64.61	23 26.3	6	16 58 48.72	+ 13.524	- 22 47 30.1	- 25.75	0 1.2
7	14 29 33.43	12.164	13 43 32.6	63.78	23 27.2	7	17 4 13.69	13.556	22 57 27.9	24.03	0 2.7
8	14 34 25.89	12.210	14 8 53.1	62.91	23 28.2	8	17 9 39.42	13.587	23 6 44.2	22.29	0 4.2
9	14 39 19.44	12.257	14 33 52.4	62.01	23 29.1	9	17 15 5.85	13.615	23 15 18.5	20.53	0 5.7
10	14 44 14.11	12.304	14 58 29.7	61.07	23 30.1	10	17 20 32.94	13.641	23 23 10.4	18.76	0 7.2
11	14 49 9.91	+ 12.351	- 15 22 44.1	- 60.10	23 31.1	11	17 26 0.63	+ 13.665	- 23 30 19.5	- 16.97	0 8.7
12	14 54 6.86	12.399	15 46 34.8	59.10	23 32.2	12	17 31 28.87	13.687	23 36 45.5	15.17	0 10.3
13	14 59 4.98	12.447	15 10 1.0	58.07	23 33.2	13	17 36 57.60	13.707	23 42 28.2	13.36	0 11.8
14	15 4 4.27	12.496	16 33 2.0	57.00	23 34.3	14	17 42 26.77	13.724	23 47 27.2	11.53	0 13.4
15	15 9 4.76	12.546	16 55 36.9	55.90	23 35.4	15	17 47 56.31	13.738	23 51 42.2	9.69	0 14.9
16	15 14 6.45	+ 12.596	- 17 17 45.1	- 54.76	23 36.5	16	17 53 26.17	+ 13.750	- 23 55 13.1	- 7.85	0 16.5
17	15 19 9.36	12.647	17 39 25.7	53.59	23 37.6	17	17 58 56.29	13.759	23 57 59.6	6.00	0 18.0
18	15 24 13.50	12.698	18 0 37.9	52.39	23 38.8	18	18 4 26.60	13.766	24 0 1.6	4.14	0 19.6
19	15 29 18.87	12.749	18 21 21.0	51.16	23 39.9	19	18 9 57.04	13.770	24 1 19.1	2.28	0 21.1
20	15 34 25.47	12.801	18 41 34.2	49.90	23 41.1	20	18 15 27.56	13.772	24 1 51.9	- 0.42	0 22.7
21	15 39 33.30	+ 12.852	- 19 1 16.7	- 48.61	23 42.3	21	18 20 58.08	+ 13.771	- 24 1 39.9	+ 1.44	0 24.2
22	15 44 42.36	12.904	19 20 27.9	47.29	23 43.5	22	18 26 28.55	13.767	24 0 43.2	3.31	0 25.8
23	15 49 52.65	12.955	19 39 6.9	45.93	23 44.8	23	18 31 58.89	13.760	23 59 1.7	5.18	0 27.4
24	15 55 4.14	13.005	19 57 13.0	44.55	23 46.1	24	18 37 29.04	13.751	23 56 35.5	7.04	0 29.0
25	16 0 16.83	13.054	20 14 45.5	43.14	23 47.4	25	18 42 58.94	13.739	23 53 24.7	8.90	0 30.6
26	16 5 30.70	+ 13.103	- 20 31 43.7	- 41.70	23 48.7	26	18 48 28.53	+ 13.725	- 23 49 29.4	+ 10.75	0 32.1
27	16 10 45.73	13.151	20 48 6.9	40.23	23 50.0	27	18 53 57.74	13.708	23 44 49.8	12.59	0 33.7
28	16 16 1.91	13.198	21 3 54.3	38.72	23 51.3	28	18 59 26.50	13.688	23 39 26.1	14.42	0 35.2
29	16 21 19.20	13.244	21 19 5.3	37.18	23 52.7	29	19 4 54.76	13.666	23 33 18.5	16.24	0 36.7
30	16 26 37.58	13.288	21 33 39.2	35.62	23 54.1	30	19 10 22.45	13.641	23 26 27.2	18.06	0 38.2
31	16 31 57.01	+ 13.331	- 21 47 35.4	- 34.03	23 55.5	31	19 15 49.51	+ 13.614	- 23 18 52.5	+ 19.87	0 39.7
32	16 37 17.46	+ 13.373	- 22 0 53.3	- 32.42	23 56.9	32	19 21 15.88	+ 13.584	- 23 10 34.8	+ 21.66	0 41.2
Day of the Month.						Day of the Month.					
2d. 7th. 12th. 17th. 22d. 27th.						2d. 7th. 12th. 17th. 22d. 27th. 32d.					
Semidiameter . . . . .						Semidiameter . . . . .					
Hor. Parallax . . . . .						Hor. Parallax . . . . .					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	1 6 7.28	+4.805	+ 7 32 59.5	+33.03	6 24.6	1	2 11 15.33	+5.643	+14 15 36.3	+30.91	5 27.6
2	1 8 3.00	4.838	7 46 12.5	33.05	6 22.6	2	2 13 31.00	5.665	14 27 56.1	30.75	5 25.9
3	1 9 59.51	4.870	7 59 26.1	33.07	6 20.6	3	2 15 47.21	5.687	14 40 11.9	30.58	5 24.2
4	1 11 56.79	4.902	8 12 39.9	33.08	6 18.6	4	2 18 3.96	5.709	14 52 23.7	30.40	5 22.6
5	1 13 54.82	4.933	8 25 53.9	33.09	6 16.6	5	2 20 21.24	5.732	15 4 31.3	30.22	5 20.9
6	1 15 53.59	+4.964	+ 8 39 8.0	+33.09	6 14.6	6	2 22 39.06	+5.754	+15 16 34.6	+30.04	5 19.2
7	1 17 53.12	4.995	8 52 22.0	33.08	6 12.7	7	2 24 57.42	5.776	15 28 33.6	29.85	5 17.6
8	1 19 53.37	5.026	9 5 35.8	33.07	6 10.8	8	2 27 16.30	5.798	15 40 28.0	29.66	5 16.0
9	1 21 54.35	5.056	9 18 49.3	33.05	6 8.9	9	2 29 35.71	5.820	15 52 17.8	29.47	5 14.4
10	1 23 56.06	5.086	9 32 2.4	33.03	6 7.0	10	2 31 55.64	5.842	16 4 2.8	29.27	5 12.8
11	1 25 58.47	+5.115	+ 9 45 14.8	+33.00	6 5.1	11	2 34 16.09	+5.863	+16 15 42.9	+29.06	5 11.2
12	1 28 1.58	5.144	9 58 26.5	32.96	6 3.2	12	2 36 37.04	5.884	16 27 18.0	28.85	5 9.6
13	1 30 5.38	5.173	10 11 37.3	32.92	6 1.3	13	2 38 58.50	5.905	16 38 47.9	28.63	5 8.0
14	1 32 9.87	5.201	10 24 47.0	32.88	5 59.4	14	2 41 20.47	5.926	16 50 12.5	28.41	5 6.5
15	1 34 15.03	5.229	10 37 55.5	32.83	5 57.6	15	2 43 42.93	5.946	17 1 31.7	28.18	5 4.9
16	1 36 20.85	+5.256	+10 51 2.7	+32.77	5 55.7	16	2 46 5.87	+5.966	+17 12 45.3	+27.94	5 3.3
17	1 38 27.31	5.283	11 4 8.3	32.70	5 53.9	17	2 48 29.28	5.986	17 23 53.2	27.69	5 1.7
18	1 40 34.41	5.309	11 17 12.1	32.62	5 52.1	18	2 50 53.17	6.005	17 34 55.2	27.44	5 0.2
19	1 42 42.12	5.335	11 30 14.1	32.54	5 50.3	19	2 53 17.52	6.024	17 45 51.2	27.18	4 58.7
20	1 44 50.45	5.360	11 43 14.0	32.45	5 48.5	20	2 55 42.32	6.043	17 56 41.0	26.92	4 57.2
21	1 46 59.38	+5.385	+11 56 11.6	+32.36	5 46.7	21	2 58 7.58	+6.062	+18 7 24.6	+26.66	4 55.7
22	1 49 8.91	5.409	12 9 6.8	32.26	5 44.9	22	3 0 33.28	6.081	18 18 1.8	26.40	4 54.2
23	1 51 19.03	5.433	12 21 59.5	32.15	5 43.1	23	3 2 59.43	6.099	18 28 32.5	26.14	4 52.7
24	1 53 29.71	5.457	12 34 49.5	32.02	5 41.3	24	3 5 26.01	6.117	18 38 56.7	25.87	4 51.2
25	1 55 40.96	5.481	12 47 36.7	31.90	5 39.6	25	3 7 53.03	6.135	18 49 14.1	25.59	4 49.7
26	1 57 52.78	+5.505	+13 0 20.9	+31.77	5 37.8	26	3 10 20.49	+6.153	+18 59 24.7	+25.30	4 48.2
27	2 0 5.16	5.528	13 13 2.0	31.64	5 36.1	27	3 12 48.38	6.171	19 9 28.3	25.01	4 46.7
28	2 2 18.09	5.551	13 25 39.8	31.50	5 34.4	28	3 15 16.69	6.189	19 19 24.9	24.71	4 45.2
29	2 4 31.57	5.574	13 38 14.3	31.36	5 32.7	29	3 17 45.44	6.207	19 29 14.4	24.41	4 43.8
30	2 6 45.61	5.597	13 50 45.3	31.22	5 31.0	30	3 20 14.61	6.225	19 38 56.7	24.11	4 42.3
31	2 9 0.20	+5.620	+14 3 12.7	+31.07	5 29.3	31	3 22 44.21	+6.243	+19 48 31.8	+23.80	4 40.8
32	2 11 15.33	+5.643	+14 15 36.3	+30.91	5 27.6	32	3 25 14.23	+6.260	+19 57 59.4	+23.49	4 39.4
Day of the Month.						Day of the Month.					
0 5th. 10th. 15th. 20th. 25th. 30th.						4th. 9th. 14th. 19th. 24th.					
" " " " " " "						" " " " " "					
Semidiameter . . . . . 5.09 4.87 4.66 4.48 4.30 4.13 3.97						Semidiameter . . . . . 3.82 3.69 3.56 3.44 3.34					
Hor. Parallax . . . . . 8.87 8.48 8.12 7.78 7.47 7.18 6.91						Horizontal Parallax . . . . . 6.66 6.42 6.20 6.00 5.82					

NOTE.—The sign + indicates north declinations; the sign - indicates south declinations.



## GREENWICH MEAN TIME.

MARCH.						APRIL.								
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.			
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.				
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m			
1	3 17 45.44	+ 6.207	+ 19 29 14.4	+ 24.41	4 43.8	1	4 37 45.80	+ 6.656	+ 23 26 25.1	+ 13.24	4 1.7			
2	3 20 14.61	6.225	19 38 56.7	24.11	4 42.3	2	4 40 25.68	6.667	23 31 38.0	12.83	4 0.4			
3	3 22 44.21	6.243	19 48 31.8	23.80	4 40.8	3	4 43 5.81	6.677	23 36 41.1	12.42	3 59.1			
4	3 25 14.23	6.260	19 57 59.4	23.49	4 39.4	4	4 45 46.19	6.687	23 41 34.2	12.00	3 57.8			
5	3 27 44.66	6.277	20 7 19.6	23.18	4 38.0	5	4 48 26.81	6.697	23 46 17.2	11.58	3 56.6			
6	3 30 15.51	+ 6.294	+ 20 16 32.2	+ 22.86	4 36.6	6	4 51 7.67	+ 6.707	+ 23 50 50.1	+ 11.16	3 55.3			
7	3 32 46.77	6.311	20 25 37.1	22.54	4 35.2	7	4 53 48.75	6.716	23 55 12.9	10.74	3 54.0			
8	3 35 18.45	6.328	20 34 34.3	22.21	4 33.8	8	4 56 30.05	6.725	23 59 25.6	10.32	3 52.7			
9	3 37 50.53	6.345	20 43 23.6	21.88	4 32.4	9	4 59 11.58	6.734	24 3 28.1	9.89	3 51.5			
10	3 40 23.01	6.362	20 52 4.9	21.55	4 31.0	10	5 1 53.31	6.743	24 7 20.3	9.46	3 50.3			
11	3 42 55.90	+ 6.379	+ 21 0 38.1	+ 21.21	4 29.6	11	5 4 35.23	+ 6.751	+ 24 11 2.1	+ 9.03	3 49.0			
12	3 45 29.19	6.395	21 9 3.2	20.87	4 28.2	12	5 7 17.34	6.759	24 14 33.6	8.60	3 47.7			
13	3 48 2.86	6.411	21 17 20.1	20.53	4 26.8	13	5 9 59.63	6.766	24 17 54.7	8.16	3 46.5			
14	3 50 36.90	6.427	21 25 28.7	20.18	4 25.4	14	5 12 42.08	6.772	24 21 5.3	7.72	3 45.3			
15	3 53 11.32	6.442	21 33 28.8	19.83	4 24.0	15	5 15 24.68	6.778	24 24 5.3	7.28	3 44.1			
16	3 55 46.11	+ 6.456	+ 21 41 20.3	+ 19.47	4 22.7	16	5 18 7.43	+ 6.784	+ 24 26 54.8	+ 6.84	3 42.8			
17	3 58 21.24	6.471	21 49 3.2	19.10	4 21.3	17	5 20 50.31	6.789	24 29 33.7	6.40	3 41.6			
18	4 0 56.72	6.485	21 56 37.3	18.73	4 19.9	18	5 23 33.31	6.794	24 32 2.0	5.96	3 40.4			
19	4 3 32.54	6.499	22 4 2.4	18.36	4 18.6	19	5 26 16.42	6.799	24 34 19.6	5.51	3 39.2			
20	4 6 8.68	6.512	22 11 18.5	17.98	4 17.3	20	5 28 59.64	6.803	24 36 26.5	5.06	3 38.0			
21	4 8 45.15	+ 6.526	+ 22 18 25.5	+ 17.60	4 16.0	21	5 31 42.96	+ 6.807	+ 24 38 22.7	+ 4.62	3 36.7			
22	4 11 21.94	6.539	22 25 23.4	17.22	4 14.6	22	5 34 26.36	6.810	24 40 8.1	4.18	3 35.5			
23	4 13 59.02	6.552	22 32 12.1	16.84	4 13.3	23	5 37 9.84	6.813	24 41 42.8	3.73	3 34.3			
24	4 16 36.41	6.564	22 38 51.6	16.45	4 12.0	24	5 39 53.39	6.816	24 43 6.7	3.28	3 33.1			
25	4 19 14.10	6.576	22 45 21.8	16.06	4 10.7	25	5 42 37.00	6.818	24 44 19.9	2.83	3 31.9			
26	4 21 52.08	+ 6.588	+ 22 51 42.5	+ 15.67	4 9.4	26	5 45 20.67	+ 6.820	+ 24 45 22.3	+ 2.38	3 30.7			
27	4 24 30.34	6.600	22 57 53.7	15.27	4 8.1	27	5 48 4.40	6.822	24 46 13.9	1.93	3 29.5			
28	4 27 8.89	6.612	23 3 55.4	14.87	4 6.8	28	5 50 48.18	6.824	24 46 54.7	1.48	3 28.3			
29	4 29 47.72	6.623	23 9 47.5	14.47	4 5.5	29	5 53 32.00	6.826	24 47 24.7	1.03	3 27.1			
30	4 32 26.82	6.634	23 15 29.8	14.06	4 4.2	30	5 56 15.85	6.827	24 47 44.0	0.58	3 25.9			
31	4 35 6.18	+ 6.645	+ 23 21 2.3	+ 13.65	4 3.0	31	5 58 59.72	+ 6.828	+ 24 47 52.4	+ 0.13	3 24.6			
32	4 37 45.80	+ 6.656	+ 23 26 25.1	+ 13.24	4 1.7	32	6 1 43.61	+ 6.829	+ 24 47 50.0	- 0.32	3 23.4			
Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
Semidiameter.	3.24	3.14	3.05	2.97	2.89	2.82	2.75	Semidiameter.	2.69	2.63	2.58	2.52	2.47	2.42
Hor. Parallax.	5.64	5.47	5.32	5.18	5.04	4.91	4.79	Hor. Parallax.	4.67	4.57	4.47	4.38	4.30	4.22

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	5 58 59.72	+ 6.828	+ 24 47 52.4	+ 0.13	3 24.6	1	7 23 10.38	+ 6.699	+ 23 24 1.8	- 13.46	2 46.8
2	6 1 43.61	6.829	24 47 50.0	- 0.32	3 23.4	2	7 25 51.07	6.691	23 18 33.9	13.87	2 45.5
3	6 4 27.52	6.829	24 47 36.9	0.78	3 22.2	3	7 28 31.57	6.683	23 12 56.1	14.28	2 44.2
4	6 7 11.44	6.830	24 47 12.9	1.23	3 21.0	4	7 31 11.87	6.675	23 7 8.5	14.69	2 42.9
5	6 9 55.36	6.830	24 46 38.1	1.68	3 19.8	5	7 33 51.97	6.666	23 1 11.2	15.09	2 41.7
6	6 12 39.27	+ 6.830	+ 24 45 52.5	- 2.13	3 18.6	6	7 36 31.86	+ 6.657	+ 22 55 4.2	- 15.49	2 40.4
7	6 15 23.17	6.829	24 44 56.1	2.58	3 17.4	7	7 39 11.54	6.648	22 48 47.5	15.89	2 39.1
8	6 18 7.04	6.828	24 43 48.9	3.03	3 16.2	8	7 41 51.00	6.639	22 42 21.2	16.29	2 37.8
9	6 20 50.89	6.827	24 42 31.0	3.48	3 15.0	9	7 44 30.23	6.630	22 35 45.4	16.69	2 36.5
10	6 23 34.69	6.825	24 41 2.3	3.92	3 13.8	10	7 47 9.23	6.620	22 29 0.2	17.08	2 35.2
11	6 26 18.44	+ 6.822	+ 24 39 22.8	- 4.37	3 12.6	11	7 49 47.99	+ 6.610	+ 22 22 5.5	- 17.47	2 33.9
12	6 29 2.13	6.819	24 37 32.6	4.82	3 11.4	12	7 52 26.51	6.600	22 15 1.5	17.86	2 32.6
13	6 31 45.75	6.816	24 35 31.7	5.27	3 10.2	13	7 55 4.78	6.590	22 7 48.2	18.25	2 31.3
14	6 34 29.28	6.812	24 33 20.2	5.71	3 9.0	14	7 57 42.80	6.579	22 0 25.8	18.63	2 30.0
15	6 37 12.72	6.808	24 30 58.0	6.15	3 7.7	15	8 0 20.56	6.568	21 52 54.2	19.01	2 28.7
16	6 39 56.07	+ 6.804	+ 24 28 25.1	- 6.59	3 6.5	16	8 2 58.06	+ 6.557	+ 21 45 13.6	- 19.39	2 27.4
17	6 42 39.31	6.799	24 25 41.6	7.03	3 5.3	17	8 5 35.30	6.546	21 37 24.0	19.76	2 26.1
18	6 45 22.43	6.794	24 22 47.5	7.47	3 4.1	18	8 8 12.27	6.535	21 29 25.6	20.13	2 24.8
19	6 48 5.42	6.789	24 19 42.9	7.91	3 2.9	19	8 10 48.98	6.524	21 21 18.3	20.49	2 23.4
20	6 50 48.28	6.783	24 16 27.8	8.35	3 1.6	20	8 13 25.42	6.513	21 13 2.3	20.85	2 22.1
21	6 53 31.00	+ 6.777	+ 24 13 2.2	- 8.79	3 0.4	21	8 16 1.59	+ 6.502	+ 21 4 37.6	- 21.21	2 20.8
22	6 56 13.58	6.771	24 9 26.2	9.22	2 59.2	22	8 18 37.48	6.490	20 56 4.4	21.57	2 19.4
23	6 58 56.01	6.765	24 5 39.8	9.65	2 58.0	23	8 21 13.10	6.479	20 47 22.6	21.92	2 18.0
24	7 1 38.28	6.758	24 1 43.0	10.08	2 56.7	24	8 23 48.45	6.467	20 38 32.3	22.27	2 16.6
25	7 4 20.40	6.751	23 57 35.9	10.50	2 55.4	25	8 26 23.54	6.456	20 29 33.6	22.62	2 15.3
26	7 7 2.35	+ 6.744	+ 23 53 18.5	- 10.93	2 54.2	26	8 28 58.35	+ 6.445	+ 20 20 26.7	- 22.96	2 14.0
27	7 9 44.13	6.737	23 48 51.0	11.36	2 53.0	27	8 31 32.90	6.434	20 11 11.6	23.30	2 12.6
28	7 12 25.74	6.730	23 44 13.3	11.78	2 51.8	28	8 34 7.18	6.423	20 1 48.3	23.64	2 11.2
29	7 15 7.18	6.723	23 39 25.5	12.20	2 50.5	29	8 36 41.20	6.412	19 52 17.0	23.97	2 9.8
30	7 17 48.43	6.715	23 34 27.6	12.62	2 49.2	30	8 39 14.95	6.401	19 42 37.6	24.30	2 8.5
31	7 20 29.50	+ 6.707	+ 23 29 19.7	- 13.04	2 48.0	31	8 41 48.44	+ 6.390	+ 19 32 50.3	- 24.63	2 7.1
32	7 23 10.38	+ 6.699	+ 23 24 1.8	- 13.46	2 46.8	32	8 44 21.67	+ 6.379	+ 19 22 55.1	- 24.96	2 5.7
Day of the Month. 5th. 10th. 15th. 20th. 25th. 30th.						Day of the Month. 4th. 9th. 14th. 19th. 24th. 29th.					
Semidiameter . . . 2.38 2.34 2.30 2.26 2.23 2.20						Semidiameter . . . 2.17 2.14 2.11 2.09 2.07 2.05					
Hor. Parallax . . . 4.14 4.07 4.00 3.94 3.88 3.83						Hor. Parallax . . . 3.77 3.72 3.68 3.64 3.60 3.56					

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	8 41 48.44	+6.390	+19 32 50.3	-24.63	2 7.1	1	9 58 57.69	+6.070	+13 31 25.0	-33.09	1 22.1
2	8 44 21.67	6.379	19 22 55.1	24.96	2 5.7	2	10 1 23.26	6.062	13 18 8.1	33.31	1 20.6
3	8 46 54.63	6.368	19 12 52.2	25.28	2 4.3	3	10 3 48.63	6.053	13 4 46.0	33.52	1 19.0
4	8 49 27.33	6.357	19 2 41.6	25.60	2 2.9	4	10 6 13.82	6.045	12 51 18.9	33.73	1 17.5
5	8 51 59.76	6.346	18 52 23.3	25.92	2 1.5	5	10 8 38.82	6.037	12 37 46.7	33.94	1 16.0
6	8 54 31.93	+6.334	+18 41 57.4	-26.24	2 0.1	6	10 11 3.63	+6.029	+12 24 9.7	-34.14	1 14.5
7	8 57 3.83	6.323	18 31 24.1	26.55	1 58.7	7	10 13 28.26	6.021	12 10 27.9	34.34	1 12.9
8	8 59 35.46	6.312	18 20 43.4	26.85	1 57.3	8	10 15 52.70	6.013	11 56 41.3	34.54	1 11.3
9	9 2 6.83	6.301	18 9 55.5	27.15	1 55.8	9	10 18 16.97	6.006	11 42 50.1	34.73	1 9.8
10	9 4 37.93	6.289	17 59 0.3	27.44	1 54.4	10	10 20 41.06	5.999	11 28 54.4	34.92	1 8.3
11	9 7 8.76	+6.278	+17 47 58.1	-27.73	1 53.0	11	10 23 4.99	+5.992	+11 14 54.3	-35.10	1 6.8
12	9 9 39.32	6.267	17 36 48.9	28.02	1 51.6	12	10 25 28.75	5.986	11 0 49.8	35.28	1 5.2
13	9 12 9.62	6.256	17 25 32.7	28.31	1 50.2	13	10 27 52.35	5.980	10 46 41.1	35.45	1 3.6
14	9 14 39.65	6.245	17 14 9.7	28.60	1 48.7	14	10 30 15.79	5.974	10 32 28.2	35.62	1 2.1
15	9 17 9.41	6.234	17 2 40.0	28.88	1 47.3	15	10 32 39.06	5.968	10 18 11.2	35.79	1 0.6
16	9 19 38.91	+6.223	+16 51 3.6	-29.16	1 45.9	16	10 35 2.19	+5.962	+10 3 50.3	-35.95	0 59.0
17	9 22 8.14	6.212	16 39 20.7	29.43	1 44.4	17	10 37 25.18	5.956	9 49 25.5	36.11	0 57.4
18	9 24 37.11	6.201	16 27 31.3	29.70	1 42.9	18	10 39 48.03	5.950	9 34 56.9	36.27	0 55.8
19	9 27 5.83	6.191	16 15 35.5	29.96	1 41.4	19	10 42 10.75	5.945	9 20 24.5	36.42	0 54.3
20	9 29 34.29	6.181	16 3 33.3	30.22	1 40.0	20	10 44 33.36	5.940	9 5 48.5	36.57	0 52.8
21	9 32 2.51	+6.171	+15 51 24.9	-30.48	1 38.5	21	10 46 55.86	+5.935	+8 51 8.9	-36.72	0 51.2
22	9 34 30.48	6.161	15 39 10.4	30.73	1 37.0	22	10 49 18.25	5.930	8 36 25.9	36.86	0 49.6
23	9 36 58.21	6.151	15 26 49.9	30.98	1 35.5	23	10 51 40.53	5.926	8 21 39.4	37.01	0 48.0
24	9 39 25.70	6.141	15 14 23.4	31.23	1 34.0	24	10 54 2.71	5.922	8 6 49.6	37.14	0 46.5
25	9 41 52.96	6.131	15 1 51.0	31.47	1 32.6	25	10 56 24.80	5.919	7 51 56.5	37.27	0 45.0
26	9 44 20.00	+6.122	+14 49 12.7	-31.71	1 31.1	26	10 58 46.82	+5.916	+7 37 0.3	-37.40	0 43.4
27	9 46 46.82	6.113	14 36 28.7	31.95	1 29.6	27	11 1 8.76	5.913	7 22 0.9	37.53	0 41.8
28	9 49 13.42	6.104	14 23 39.0	32.19	1 28.1	28	11 3 30.64	5.910	7 6 58.5	37.66	0 40.2
29	9 51 39.80	6.095	14 10 43.7	32.42	1 26.6	29	11 5 52.45	5.908	6 51 53.1	37.78	0 38.7
30	9 54 5.97	6.086	13 57 42.9	32.65	1 25.1	30	11 8 14.21	5.906	6 36 44.9	37.90	0 37.1
31	9 56 31.93	+6.078	+13 44 36.6	-32.87	1 23.6	31	11 10 35.91	+5.904	+6 21 33.9	-38.01	0 35.5
32	9 58 57.69	+6.070	+13 31 25.0	-33.09	1 22.1	32	11 12 57.57	+5.902	+6 6 20.3	-38.12	0 33.9

Day of the Month.	4th.	0th.	14th.	19th.	24th.	29th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter . .	2.03	2.01	1.99	1.98	1.96	1.95	Semidiameter . .	1.94	1.94	1.93	1.92	1.92	1.91
Hor. Parallax . .	3.53	3.50	3.47	3.45	3.42	3.40	Hor. Parallax . .	3.38	3.37	3.35	3.34	3.34	3.33

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.							
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.		
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.			
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m		
1	11 12 57.57	+ 5.902	+ 6 6 20.3	- 38.12	0 33.9	1	12 23 53.60	+ 5.964	- 1 43 24.6	- 39.61	23 45.0		
2	11 15 19.19	5.900	5 51 4.1	38.23	0 32.3	2	12 26 16.80	5.970	1 59 15.1	39.60	23 43.4		
3	11 17 40.77	5.899	5 35 45.4	38.33	0 30.7	3	12 28 40.15	5.977	2 15 5.3	39.58	23 41.9		
4	11 20 2.32	5.898	5 20 24.3	38.43	0 29.1	4	12 31 3.66	5.984	2 30 55.1	39.56	23 40.3		
5	11 22 23.84	5.897	5 5 0.9	38.52	0 27.5	5	12 33 27.34	5.991	2 46 44.4	39.54	23 38.8		
6	11 24 45.33	+ 5.896	+ 4 49 35.3	- 38.61	0 25.9	6	12 35 51.20	+ 5.998	- 3 2 33.1	- 39.51	23 37.3		
7	11 27 6.81	5.895	4 34 7.7	38.69	0 24.3	7	12 38 15.23	6.005	3 18 21.0	39.48	23 35.7		
8	11 29 28.27	5.894	4 18 38.0	38.77	0 22.8	8	12 40 39.45	6.013	3 34 8.1	39.44	23 34.1		
9	11 31 49.73	5.894	4 3 6.4	38.85	0 21.2	9	12 43 3.85	6.021	3 49 54.2	39.40	23 32.6		
10	11 34 11.18	5.894	3 47 33.1	38.92	0 19.6	10	12 45 28.45	6.029	4 5 39.2	39.35	23 31.1		
11	11 36 32.64	+ 5.894	+ 3 31 58.1	- 38.99	0 18.0	11	12 47 53.25	+ 6.038	- 4 21 23.1	- 39.30	23 29.6		
12	11 38 54.11	5.895	3 16 21.5	39.06	0 16.4	12	12 50 18.27	6.047	4 37 5.7	39.25	23 28.1		
13	11 41 15.60	5.896	3 0 43.4	39.12	0 14.9	13	12 52 43.50	6.056	4 52 46.9	39.19	23 26.6		
14	11 43 37.11	5.897	2 45 3.8	39.18	0 13.3	14	12 55 8.95	6.065	5 8 26.7	39.13	23 25.1		
15	11 45 58.65	5.898	2 29 22.9	39.23	0 11.7	15	12 57 34.63	6.075	5 24 4.9	39.06	23 23.6		
16	11 48 20.23	+ 5.900	+ 2 13 40.7	- 39.28	0 10.1	16	13 0 0.55	+ 6.085	- 5 39 41.4	- 38.99	23 22.0		
17	11 50 41.85	5.902	1 57 57.4	39.33	0 8.5	17	13 2 26.71	6.095	5 55 16.2	38.91	23 20.5		
18	11 53 3.52	5.905	1 42 13.0	39.37	0 7.0	18	13 4 53.13	6.106	6 10 49.1	38.83	23 19.0		
19	11 55 25.26	5.908	1 26 27.6	39.41	0 5.4	19	13 7 19.81	6.117	6 26 20.0	38.74	23 17.5		
20	11 57 47.06	5.911	1 10 41.3	39.45	0 3.8	20	13 9 46.76	6.129	6 41 48.8	38.65	23 16.0		
21	12 0 8.94	+ 5.914	+ 0 54 54.2	- 39.48	0 2.2	21	13 12 13.99	+ 6.141	- 6 57 15.5	- 38.56	23 14.6		
22	12 2 30.90	5.917	0 39 6.3	39.51	0 0.6	22	13 14 41.50	6.153	7 12 40.0	38.47	23 13.1		
23	12 4 52.95	5.921	0 23 17.6	39.53	23 57.5	23	13 17 9.31	6.165	7 28 2.1	38.37	23 11.6		
24	12 7 15.11	5.925	+ 0 7 28.4	39.55	23 55.9	24	13 19 37.43	6.178	7 43 21.8	38.27	23 10.1		
25	12 9 37.37	5.930	- 0 8 21.2	39.57	23 54.4	25	13 22 5.85	6.191	7 58 38.9	38.16	23 8.6		
26	12 11 59.75	+ 5.935	- 0 24 11.3	- 39.59	23 52.8	26	13 24 34.59	+ 6.204	- 8 13 53.3	- 38.04	23 7.2		
27	12 14 22.25	5.940	0 40 1.7	39.60	23 51.2	27	13 27 3.65	6.218	8 29 4.9	37.92	23 5.7		
28	12 16 44.88	5.946	0 55 52.3	39.61	23 49.6	28	13 29 33.03	6.232	8 44 13.6	37.79	23 4.2		
29	12 19 7.65	5.952	1 11 43.1	39.62	23 48.0	29	13 32 2.74	6.246	8 59 19.2	37.66	23 2.8		
30	12 21 30.55	5.958	1 27 33.9	39.62	23 46.5	30	13 34 32.79	6.260	9 14 21.7	37.53	23 1.4		
31	12 23 53.60	+ 5.964	- 1 43 24.6	- 39.61	23 45.0	31	13 37 3.18	+ 6.274	- 9 29 20.9	- 37.39	23 0.0		
32	12 26 16.80	+ 5.970	- 1 59 15.1	- 39.60	23 43.4	32	13 39 33.92	+ 6.288	- 9 44 16.7	- 37.25	22 58.6		
Day of the Month.						Day of the Month.							
	2d.	7th.	12th.	17th.	22d.	27th.		2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter	1.91	1.91	1.91	1.91	1.91	1.91	Semidiameter	1.92	1.92	1.93	1.93	1.94	1.95
Hor. Parallax	3.32	3.32	3.32	3.32	3.33	3.33	Hor. Parallax	3.34	3.34	3.35	3.36	3.38	3.40

NOTE.—The sign + indicates north declinations; the sign - indicates south declinations.

## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	13 39 33.92	+ 6.288	9 44 16.7	- 37.25	22 58.6	1	14 58 1.99	+ 6.821	16 35 23.5	- 30.47	22 19.1
2	13 42 5.00	6.303	9 59 9.0	37.10	22 57.2	2	15 0 45.94	6.841	16 47 31.4	30.16	22 17.9
3	13 44 36.44	6.318	10 13 57.6	36.95	22 55.8	3	15 3 30.37	6.861	16 59 31.8	29.84	22 16.7
4	13 47 8.24	6.333	10 28 42.4	36.79	22 54.4	4	15 6 15.29	6.881	17 11 24.5	29.52	22 15.5
5	13 49 40.40	6.348	10 43 23.2	36.62	22 53.0	5	15 9 0.70	6.902	17 23 9.3	29.20	22 14.3
6	13 52 12.93	+ 6.363	- 10 58 0.0	- 36.45	22 51.6	6	15 11 46.60	+ 6.923	- 17 34 46.2	- 28.87	22 13.1
7	13 54 45.84	6.379	11 12 32.6	36.27	22 50.2	7	15 14 32.98	6.943	17 46 15.0	28.53	22 11.9
8	13 57 19.12	6.395	11 27 0.9	36.09	22 48.8	8	15 17 19.84	6.964	17 57 35.6	28.18	22 10.7
9	13 59 52.79	6.411	11 41 24.8	35.90	22 47.4	9	15 20 7.19	6.984	18 8 47.8	27.83	22 9.6
10	14 2 26.84	6.427	11 55 44.1	35.71	22 46.1	10	15 22 55.03	7.004	18 19 51.5	27.47	22 8.5
11	14 5 1.29	+ 6.444	- 12 9 58.7	- 35.51	22 44.7	11	15 25 43.36	+ 7.024	- 18 30 46.5	- 27.11	22 7.4
12	14 7 36.14	6.461	12 24 8.6	35.31	22 43.3	12	15 28 32.19	7.044	18 41 32.8	26.74	22 6.3
13	14 10 11.39	6.478	12 38 13.5	35.10	22 42.0	13	15 31 21.52	7.065	18 52 10.2	26.37	22 5.2
14	14 12 47.06	6.495	12 52 13.4	34.89	22 40.7	14	15 34 11.34	7.085	19 2 38.6	25.99	22 4.1
15	14 15 23.14	6.512	13 6 8.1	34.67	22 39.4	15	15 37 1.66	7.106	19 12 57.8	25.61	22 3.0
16	14 17 59.65	+ 6.530	- 13 19 57.6	- 34.45	22 38.0	16	15 39 52.47	+ 7.127	- 19 23 7.8	- 25.22	22 1.9
17	14 20 36.59	6.548	13 33 41.7	34.22	22 36.7	17	15 42 43.78	7.148	19 33 8.4	24.82	22 0.8
18	14 23 13.98	6.567	13 47 20.3	33.99	22 35.4	18	15 45 35.60	7.169	19 42 59.5	24.42	21 59.7
19	14 25 51.81	6.586	14 0 53.3	33.75	22 34.1	19	15 48 27.92	7.190	19 52 41.0	24.02	21 58.6
20	14 28 30.08	6.605	14 14 20.5	33.51	22 32.8	20	15 51 20.74	7.211	20 2 12.7	23.61	21 57.6
21	14 31 8.81	+ 6.624	- 14 27 41.8	- 33.27	22 31.5	21	15 54 14.07	+ 7.232	- 20 11 34.5	- 23.20	21 56.5
22	14 33 48.01	6.643	14 40 57.2	33.02	22 30.2	22	15 57 7.89	7.253	20 20 46.3	22.78	21 55.5
23	14 36 27.67	6.662	14 54 6.5	32.76	22 28.9	23	16 0 2.21	7.273	20 29 47.9	22.35	21 54.5
24	14 39 7.80	6.682	15 7 9.5	32.49	22 27.6	24	16 2 57.02	7.294	20 38 39.2	21.92	21 53.5
25	14 41 48.39	6.702	15 20 6.1	32.22	22 26.4	25	16 5 52.32	7.314	20 47 20.1	21.48	21 52.5
26	14 44 29.45	+ 6.722	- 15 32 56.2	- 31.95	22 25.1	26	16 8 48.10	+ 7.334	- 20 55 50.4	- 21.04	21 51.5
27	14 47 10.99	6.741	15 45 39.6	31.67	22 23.9	27	16 11 44.36	7.354	21 4 10.0	20.59	21 50.5
28	14 49 53.02	6.761	15 58 16.1	31.37	22 22.7	28	16 14 41.10	7.373	21 12 18.7	20.14	21 49.5
29	14 52 35.53	6.781	16 10 45.7	31.09	22 21.5	29	16 17 38.31	7.393	21 20 16.5	19.68	21 48.5
30	14 55 18.52	6.801	16 23 8.2	30.78	22 20.3	30	16 20 35.98	7.412	21 28 3.1	19.21	21 47.5
31	14 58 1.99	+ 6.821	- 16 35 23.5	- 30.47	22 19.1	31	16 23 34.10	+ 7.431	- 21 35 38.5	- 18.74	21 46.6
32	15 0 45.94	+ 6.841	- 16 47 31.4	- 30.16	22 17.9	32	16 26 32.67	+ 7.450	- 21 43 2.5	- 18.26	21 45.8
Day of the Month.						Day of the Month.					
1st. 6th. 11th. 16th. 21st. 26th.						1st. 6th. 11th. 16th. 21st. 26th. 31st.					
Semidiameter . . . 1.96 1.97 1.99 2.00 2.01 2.03						Semidiameter . . . 2.05 2.07 2.09 2.12 2.14 2.17 2.19					
Hor. Parallax . . . 3.42 3.44 3.46 3.49 3.51 3.54						Hor. Parallax . . . 3.57 3.61 3.64 3.68 3.72 3.77 3.82					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	12 51 3.13	+0.801	-4 3 14.2	-4.38	18 7.3	1	12 55 46.14	-0.064	-4 24 7.7	+1.11	16 9.9
2	12 51 22.05	0.776	4 4 57.4	4.22	18 3.7	2	12 55 44.26	0.094	4 23 38.9	1.29	16 5.9
3	12 51 40.36	0.751	4 6 36.7	4.06	18 0.1	3	12 55 41.67	0.123	4 23 5.8	1.47	16 1.9
4	12 51 58.06	0.725	4 8 12.0	3.89	17 56.4	4	12 55 38.37	0.153	4 22 28.3	1.66	15 57.9
5	12 52 15.15	0.699	4 9 43.3	3.72	17 52.7	5	12 55 34.37	0.183	4 21 46.4	1.84	15 53.9
6	12 52 31.62	+0.673	-4 11 10.6	-3.55	17 49.1	6	12 55 29.66	-0.212	-4 21 0.2	+2.02	15 49.9
7	12 52 47.46	0.647	4 12 33.8	3.38	17 45.5	7	12 55 24.24	0.241	4 20 9.6	2.20	15 45.9
8	12 53 2.66	0.621	4 13 52.8	3.21	17 41.7	8	12 55 18.11	0.270	4 19 14.6	2.38	15 41.9
9	12 53 17.23	0.594	4 15 7.6	3.03	17 38.0	9	12 55 11.28	0.299	4 18 15.4	2.56	15 37.8
10	12 53 31.16	0.567	4 16 18.2	2.86	17 34.3	10	12 55 3.76	0.328	4 17 12.0	2.74	15 33.7
11	12 53 44.43	+0.540	-4 17 24.6	-2.69	17 30.6	11	12 54 55.55	-0.357	-4 16 4.4	+2.91	15 29.6
12	12 53 57.04	0.512	4 18 26.8	2.52	17 26.9	12	12 54 46.65	0.385	4 14 52.5	3.08	15 25.5
13	12 54 8.99	0.484	4 19 24.8	2.34	17 23.1	13	12 54 37.06	0.413	4 13 36.5	3.25	15 21.4
14	12 54 20.27	0.456	4 20 18.7	2.16	17 19.4	14	12 54 26.80	0.441	4 12 16.4	3.42	15 17.3
15	12 54 30.88	0.428	4 21 8.3	1.98	17 15.6	15	12 54 15.87	0.469	4 10 52.3	3.59	15 13.2
16	12 54 40.82	+0.400	-4 21 53.6	-1.80	17 11.8	16	12 54 4.27	-0.497	-4 9 24.1	+3.76	15 9.1
17	12 54 50.08	0.372	4 22 34.6	1.62	17 8.0	17	12 53 52.02	0.524	4 7 52.0	3.92	15 5.0
18	12 54 58.67	0.344	4 23 11.3	1.44	17 4.2	18	12 53 39.13	0.551	4 6 16.0	4.08	15 0.8
19	12 55 6.57	0.315	4 23 43.6	1.26	17 0.4	19	12 53 25.59	0.577	4 4 36.1	4.24	14 56.7
20	12 55 13.79	0.287	4 24 11.6	1.08	16 56.6	20	12 53 11.42	0.603	4 2 52.5	4.40	14 52.5
21	12 55 20.32	+0.258	-4 24 35.3	-0.90	16 52.8	21	12 52 56.62	-0.629	-4 1 5.1	+4.56	14 48.3
22	12 55 26.16	0.229	4 24 54.7	0.72	16 49.0	22	12 52 41.21	0.655	3 59 14.0	4.71	14 44.1
23	12 55 31.30	0.200	4 25 9.7	0.54	16 45.2	23	12 52 25.19	0.680	3 57 19.2	4.86	14 39.9
24	12 55 35.75	0.171	4 25 20.3	0.36	16 41.3	24	12 52 8.57	0.704	3 55 20.9	5.00	14 35.7
25	12 55 39.51	0.142	4 25 26.5	-0.18	16 37.3	25	12 51 51.36	0.728	3 53 19.2	5.14	14 31.5
26	12 55 42.57	+0.113	-4 25 28.3	0.00	16 33.4	26	12 51 33.57	-0.752	-3 51 14.1	+5.28	14 27.2
27	12 55 44.93	0.084	4 25 25.8	+0.18	16 29.5	27	12 51 15.22	0.776	3 49 5.5	5.42	14 23.0
28	12 55 46.58	0.055	4 25 18.9	0.37	16 25.6	28	12 50 56.31	0.799	3 46 53.6	5.56	14 18.8
29	12 55 47.53	+0.025	4 25 7.7	0.56	16 21.7	29	12 50 36.85	0.822	3 44 38.6	5.69	14 14.5
30	12 55 47.78	-0.004	4 24 52.1	0.75	16 17.8	30	12 50 16.85	0.844	3 42 20.5	5.82	14 10.2
31	12 55 47.32	-0.034	-4 24 32.1	+0.93	16 13.9	31	12 49 56.33	-0.866	-3 39 59.3	+5.94	14 5.9
32	12 55 46.14	-0.064	-4 24 7.7	+1.11	16 9.9	32	12 49 35.29	-0.887	-3 37 35.1	+6.06	14 1.6
Day of the Month.						Day of the Month.					
Semidiameter . . . . .						Semidiameter . . . . .					
Horizontal Parallax . . . . .						Horizontal Parallax . . . . .					

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	12 50 36.85	-0.822	-3 44 38.6	+5.69	14 14.5	1	12 37 25.02	-1.186	-2 17 26.3	+7.58	11 59.3
2	12 50 16.85	0.844	3 42 20.5	5.82	14 10.2	2	12 36 56.56	1.185	2 14 24.5	7.56	11 54.9
3	12 49 56.33	0.866	3 39 59.3	5.94	14 5.9	3	12 36 28.14	1.183	2 11 23.3	7.54	11 50.5
4	12 49 35.29	0.887	3 37 35.1	6.06	14 1.6	4	12 35 59.77	1.181	2 8 22.8	7.51	11 46.1
5	12 49 13.76	0.908	3 35 8.0	6.18	13 57.3	5	12 35 31.47	1.178	2 5 23.1	7.47	11 41.7
6	12 48 51.74	-0.928	-3 32 38.1	+6.29	13 53.0	6	12 35 3.26	-1.174	-2 2 24.3	+7.43	11 37.3
7	12 48 29.25	0.947	3 30 5.5	6.40	13 48.7	7	12 34 35.16	1.169	1 59 26.5	7.38	11 32.9
8	12 48 6.30	0.965	3 27 30.3	6.51	13 44.4	8	12 34 7.19	1.163	1 56 29.9	7.33	11 28.5
9	12 47 42.91	0.983	3 24 52.6	6.62	13 40.1	9	12 33 39.37	1.156	1 53 34.6	7.27	11 24.1
10	12 47 19.10	1.001	3 22 12.5	6.72	13 35.8	10	12 33 11.72	1.148	1 50 40.8	7.20	11 19.7
11	12 46 54.88	-1.018	-3 19 30.1	+6.81	13 31.5	11	12 32 44.26	-1.139	-1 47 48.6	+7.13	11 15.3
12	12 46 30.28	1.034	3 16 45.4	6.89	13 27.1	12	12 32 17.01	1.130	1 44 58.1	7.06	11 11.0
13	12 46 5.30	1.049	3 13 58.7	6.97	13 22.8	13	12 31 50.00	1.120	1 42 9.5	6.98	11 6.6
14	12 45 39.96	1.063	3 11 10.1	7.05	13 18.4	14	12 31 23.23	1.109	1 39 22.9	6.90	11 2.2
15	12 45 14.28	1.076	3 8 19.8	7.13	13 14.1	15	12 30 56.73	1.097	1 36 38.4	6.81	10 57.8
16	12 44 48.30	-1.089	-3 5 27.8	+7.20	13 9.7	16	12 30 30.52	-1.085	-1 33 56.0	+6.71	10 53.5
17	12 44 22.02	1.101	3 2 34.2	7.26	13 5.3	17	12 30 4.61	1.072	1 31 16.0	6.61	10 49.1
18	12 43 55.46	1.112	2 59 39.1	7.32	13 0.9	18	12 29 39.03	1.059	1 28 38.4	6.51	10 44.7
19	12 43 28.63	1.122	2 56 42.7	7.37	12 56.5	19	12 29 13.79	1.045	1 26 3.3	6.41	10 40.4
20	12 43 1.57	1.132	2 53 45.1	7.42	12 52.1	20	12 28 48.90	1.030	1 23 30.7	6.30	10 36.1
21	12 42 34.29	-1.141	-2 50 46.5	+7.46	12 47.7	21	12 28 24.37	-1.015	-1 21 0.8	+6.18	10 31.8
22	12 42 6.81	1.149	2 47 46.9	7.50	12 43.3	22	12 28 0.22	0.999	1 18 33.7	6.06	10 27.5
23	12 41 39.14	1.156	2 44 46.5	7.53	12 38.9	23	12 27 36.47	0.982	1 16 9.5	5.94	10 23.2
24	12 41 11.31	1.162	2 41 45.4	7.56	12 34.5	24	12 27 13.12	0.964	1 13 48.3	5.82	10 18.9
25	12 40 43.33	1.168	2 38 43.7	7.58	12 30.1	25	12 26 50.20	0.946	1 11 30.1	5.69	10 14.6
26	12 40 15.23	-1.173	-2 35 41.6	+7.59	12 25.7	26	12 26 27.73	-0.927	-1 9 15.1	+5.56	10 10.3
27	12 39 47.02	1.177	2 32 39.2	7.60	12 21.3	27	12 26 5.70	0.908	1 7 3.3	5.43	10 6.0
28	12 39 18.72	1.180	2 29 36.6	7.60	12 16.9	28	12 25 44.12	0.889	1 4 54.7	5.29	10 1.7
29	12 38 50.35	1.183	2 26 34.0	7.61	12 12.5	29	12 25 23.01	0.869	1 2 49.4	5.15	9 57.4
30	12 38 21.93	1.185	2 23 31.3	7.61	12 8.1	30	12 25 2.40	0.848	1 0 47.6	5.01	9 53.1
31	12 37 53.48	-1.186	-2 20 28.6	+7.60	12 3.7	31	12 24 42.29	-0.827	-0 58 49.3	+4.86	9 48.8
32	12 37 25.02	-1.186	-2 17 26.3	+7.58	11 59.3	32	12 24 22.69	-0.805	-0 56 54.4	+4.71	9 44.6

Day of the Month.	7th.	15th.	23d.	31st.	Day of the Month.	8th.	16th.	24th.
Semidiameter . . . . .	20.70	20.93	21.08	21.13	Semidiameter . . . . .	21.09	20.96	20.75
Horizontal Parallax . . . . .	1.94	1.96	1.97	1.98	Horizontal Parallax . . . . .	1.97	1.96	1.94

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	12 24 42.29	-0.827	-0 58 49.3	+4.86	9 48.8	1	12 19 13.08	-0.026	-0 30 59.7	-0.52	7 41.5
2	12 24 22.69	0.805	0 56 54.4	4.71	9 44.6	2	12 19 12.76	+0.001	0 31 14.3	0.70	7 37.6
3	12 24 3.61	0.783	0 55 3.1	4.56	9 40.4	3	12 19 13.09	0.028	0 31 33.3	0.88	7 33.7
4	12 23 45.06	0.761	0 53 15.6	4.40	9 36.2	4	12 19 14.09	0.056	0 31 56.6	1.06	7 29.8
5	12 23 27.06	0.738	0 51 32.0	4.24	9 32.0	5	12 19 15.75	0.084	0 32 24.2	1.24	7 25.9
6	12 23 9.62	-0.715	-0 49 52.2	+4.08	9 27.7	6	12 19 18.07	+0.111	-0 32 56.0	-1.42	7 22.0
7	12 22 52.74	0.691	0 48 16.2	3.92	9 23.5	7	12 19 21.06	0.138	0 33 32.1	1.60	7 18.1
8	12 22 36.43	0.667	0 46 44.2	3.76	9 19.3	8	12 19 24.71	0.165	0 34 12.4	1.77	7 14.2
9	12 22 20.71	0.642	0 45 16.1	3.59	9 15.1	9	12 19 29.01	0.192	0 34 57.0	1.95	7 10.3
10	12 22 5.59	0.617	0 43 52.0	3.42	9 10.9	10	12 19 33.96	0.219	0 35 46.0	2.13	7 6.5
11	12 21 51.06	-0.598	-0 42 32.0	+3.25	9 6.7	11	12 19 39.56	+0.246	-0 36 39.3	-2.31	7 2.7
12	12 21 37.14	0.567	0 41 16.2	3.08	9 2.5	12	12 19 45.81	0.273	0 37 36.6	2.48	6 58.9
13	12 21 23.83	0.541	0 40 4.6	2.91	8 58.4	13	12 19 52.70	0.300	0 38 38.1	2.65	6 55.1
14	12 21 11.15	0.515	0 38 57.3	2.73	8 54.3	14	12 20 0.24	0.327	0 39 43.7	2.82	6 51.3
15	12 20 59.10	0.489	0 37 54.1	2.55	8 50.1	15	12 20 8.42	0.354	0 40 53.4	2.99	6 47.5
16	12 20 47.68	-0.463	-0 36 55.2	+2.37	8 45.9	16	12 20 17.23	+0.380	-0 42 7.1	-3.16	6 43.7
17	12 20 36.89	0.437	0 36 0.6	2.19	8 41.8	17	12 20 26.66	0.406	0 43 24.8	3.33	6 39.9
18	12 20 26.74	0.410	0 35 10.3	2.01	8 37.8	18	12 20 36.71	0.432	0 44 46.5	3.49	6 36.1
19	12 20 17.23	0.383	0 34 24.2	1.83	8 33.7	19	12 20 47.38	0.458	0 46 12.3	3.66	6 32.4
20	12 20 8.37	0.355	0 33 42.5	1.65	8 29.6	20	12 20 58.66	0.483	0 47 42.0	3.82	6 28.6
21	12 20 0.16	-0.328	-0 33 5.1	+1.47	8 25.5	21	12 21 10.55	+0.508	-0 49 15.5	-3.98	6 24.9
22	12 19 52.60	0.301	0 32 32.0	1.29	8 21.5	22	12 21 23.05	0.533	0 50 52.8	4.14	6 21.2
23	12 19 45.69	0.274	0 32 3.2	1.11	8 17.4	23	12 21 36.15	0.558	0 52 34.0	4.30	6 17.5
24	12 19 39.44	0.247	0 31 38.8	0.92	8 13.4	24	12 21 49.85	0.583	0 54 19.0	4.46	6 13.8
25	12 19 33.84	0.220	0 31 18.8	0.74	8 9.4	25	12 22 4.14	0.608	0 56 7.7	4.61	6 10.1
26	12 19 28.89	-0.193	-0 31 3.1	+0.56	8 5.4	26	12 22 19.02	+0.632	-0 58 0.0	-4.76	6 6.4
27	12 19 24.60	0.166	0 30 51.6	0.38	8 1.4	27	12 22 34.48	0.656	0 59 56.0	4.91	6 2.8
28	12 19 20.97	0.138	0 30 44.5	0.20	7 57.4	28	12 22 50.52	0.680	1 1 55.6	5.06	5 59.1
29	12 19 18.00	0.109	0 30 41.8	+0.02	7 53.4	29	12 23 7.13	0.704	1 3 58.8	5.21	5 55.4
30	12 19 15.70	0.082	0 30 43.5	-0.16	7 49.5	30	12 23 24.31	0.728	1 6 5.6	5.36	5 51.8
31	12 19 14.06	-0.054	-0 30 49.4	-0.34	7 45.5	31	12 23 42.06	+0.752	-1 8 16.1	-5.51	5 48.2
32	12 19 13.08	-0.026	-0 30 59.7	-0.52	7 41.5	32	12 24 0.37	+0.775	-1 10 30.1	-5.66	5 44.5
Day of the Month.	2d.	10th.	18th.	26th.		Day of the Month.	8d.	11th.	19th.	27th.	
Semidiameter . . . . .	20.46	20.12	19.73	19.32		Semidiameter . . . . .	18.89	18.45	18.02	17.61	
Horizontal Parallax . . . . .	1.91	1.88	1.85	1.81		Horizontal Parallax . . . . .	1.77	1.73	1.69	1.65	

NOTE.—The sign + indicates north declinations; the sign - indicates south declinations.



## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	12 23 42.06	+0.752	-1 8 16.1	-5.51	5 48.2	1	12 37 4.24	+1.368	-2 41 29.6	-9.26	3 59.6
2	12 24 0.37	0.775	1 10 30.1	5.66	5 44.5	2	12 37 37.27	1.384	2 45 12.9	9.35	3 56.3
3	12 24 19.23	0.798	1 12 47.5	5.80	5 40.9	3	12 38 10.70	1.400	2 48 58.5	9.44	3 52.9
4	12 24 38.65	0.821	1 15 8.3	5.95	5 37.3	4	12 38 44.51	1.416	2 52 46.3	9.53	3 49.5
5	12 24 58.62	0.844	1 17 32.6	6.09	5 33.7	5	12 39 18.71	1.432	2 56 36.3	9.62	3 46.1
6	12 25 19.13	+0.866	-1 20 0.3	-6.23	5 30.1	6	12 39 53.29	+1.448	-3 0 28.4	-9.71	3 42.8
7	12 25 40.17	0.888	1 22 31.4	6.37	5 26.5	7	12 40 28.24	1.464	3 4 22.7	9.80	3 39.4
8	12 26 1.75	0.910	1 25 5.7	6.50	5 22.9	8	12 41 3.55	1.479	3 8 19.0	9.89	3 36.0
9	12 26 23.87	0.932	1 27 43.3	6.63	5 19.4	9	12 41 39.21	1.494	3 12 17.3	9.98	3 32.7
10	12 26 46.50	0.954	1 30 24.2	6.76	5 15.8	10	12 42 15.23	1.508	3 16 17.6	10.06	3 29.4
11	12 27 9.63	+0.975	-1 33 8.2	-6.90	5 12.2	11	12 42 51.59	+1.522	-3 20 19.8	-10.14	3 26.0
12	12 27 33.27	0.996	1 35 55.3	7.03	5 8.7	12	12 43 28.29	1.536	3 24 23.9	10.21	3 22.7
13	12 27 57.42	1.017	1 38 45.5	7.16	5 5.2	13	12 44 5.33	1.550	3 28 29.8	10.29	3 19.4
14	12 28 22.08	1.037	1 41 38.8	7.29	5 1.7	14	12 44 42.71	1.564	3 32 37.5	10.36	3 16.1
15	12 28 47.23	1.057	1 44 35.1	7.41	4 58.2	15	12 45 20.42	1.578	3 36 46.9	10.43	3 12.8
16	12 29 12.87	+1.077	-1 47 34.3	-7.53	4 54.7	16	12 45 58.44	+1.591	-3 40 58.0	-10.50	3 9.5
17	12 29 38.98	1.097	1 50 36.4	7.65	4 51.2	17	12 46 36.77	1.604	3 45 10.8	10.57	3 6.2
18	12 30 5.56	1.117	1 53 41.4	7.77	4 47.7	18	12 47 15.41	1.617	3 49 25.2	10.64	3 2.9
19	12 30 32.60	1.136	1 56 49.2	7.89	4 44.2	19	12 47 54.35	1.630	3 53 41.3	10.71	2 59.6
20	12 31 0.10	1.155	1 59 59.8	8.00	4 40.7	20	12 48 33.59	1.642	3 57 58.9	10.77	2 56.3
21	12 31 28.07	+1.174	-2 3 13.2	-8.11	4 37.3	21	12 49 13.13	+1.654	-4 2 18.0	-10.83	2 53.0
22	12 31 56.48	1.193	2 6 29.3	8.22	4 33.8	22	12 49 52.97	1.666	4 6 38.7	10.89	2 49.8
23	12 32 25.33	1.211	2 9 48.0	8.33	4 30.3	23	12 50 33.10	1.678	4 11 0.8	10.95	2 46.5
24	12 32 54.62	1.229	2 13 9.3	8.44	4 26.9	24	12 51 13.51	1.690	4 15 24.3	11.01	2 43.2
25	12 33 24.36	1.247	2 16 33.1	8.55	4 23.5	25	12 51 54.19	1.702	4 19 49.2	11.07	2 40.0
26	12 33 54.52	+1.265	-2 19 59.5	-8.66	4 20.0	26	12 52 35.14	+1.713	-4 24 15.5	-11.13	2 36.8
27	12 34 25.10	1.283	2 23 28.4	8.76	4 16.6	27	12 53 16.37	1.724	4 28 43.2	11.18	2 33.5
28	12 34 56.10	1.300	2 26 59.8	8.86	4 13.2	28	12 53 57.87	1.735	4 33 12.1	11.23	2 30.2
29	12 35 27.52	1.317	2 30 33.7	8.96	4 9.8	29	12 54 39.63	1.746	4 37 42.3	11.28	2 27.0
30	12 35 59.36	1.334	2 34 10.0	9.06	4 6.4	30	12 55 21.65	1.757	4 42 13.7	11.33	2 23.8
31	12 36 31.60	+1.351	-2 37 48.6	-9.16	4 3.0	31	12 56 3.93	+1.767	-4 46 46.4	-11.38	2 20.5
32	12 37 4.24	+1.368	-2 41 29.6	-9.26	3 59.6	32	12 56 46.45	+1.777	-4 51 20.2	-11.43	2 17.3

Day of the Month.	5th.	18th.	21st.	29th.	Day of the Month.	6th.	14th.	22d.	30th.
Semidiameter . . . . .	17.21	16.83	16.48	16.15	Semidiameter . . . . .	15.86	15.60	15.37	15.17
Horizontal Parallax . . . . .	1.61	1.57	1.54	1.51	Horizontal Parallax . . . . .	1.48	1.46	1.44	1.42

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.										
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.					
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.						
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m					
1	12 56 46.45	+ 1.777	- 4 51 20.2	- 11.43	2 17.3	1	13 19 34.53	+ 1.996	- 7 14 4.5	- 12.14	0 42.1					
2	12 57 29.22	1.787	4 55 55.1	11.48	2 14.1	2	13 20 22.50	2.001	7 18 56.0	12.14	0 38.9					
3	12 58 12.23	1.797	5 0 31.1	11.52	2 10.9	3	13 21 10.57	2.005	7 23 47.5	12.14	0 35.7					
4	12 58 55.47	1.807	5 5 8.2	11.56	2 7.7	4	13 21 58.74	2.009	7 28 39.0	12.14	0 32.6					
5	12 59 38.94	1.816	5 9 46.2	11.60	2 4.5	5	13 22 47.02	2.013	7 33 30.5	12.14	0 29.5					
6	13 0 22.63	+ 1.825	- 5 14 25.1	- 11.64	2 1.3	6	13 23 35.39	+ 2.017	- 7 38 22.0	- 12.14	0 26.4					
7	13 1 6.55	1.834	5 19 5.0	11.68	1 58.1	7	13 24 23.84	2.021	7 43 13.3	12.13	0 23.3					
8	13 1 50.68	1.843	5 23 45.8	11.72	1 54.9	8	13 25 12.37	2.024	7 48 4.4	12.12	0 20.2					
9	13 2 35.02	1.852	5 28 27.4	11.75	1 51.7	9	13 26 0.99	2.027	7 52 55.4	12.11	0 17.1					
10	13 3 19.57	1.861	5 33 9.8	11.78	1 48.5	10	13 26 49.68	2.030	7 57 46.1	12.10	0 13.9					
11	13 4 4.32	+ 1.869	- 5 37 53.0	- 11.81	1 45.3	11	13 27 38.43	+ 2.033	- 8 2 36.5	- 12.09	0 10.8					
12	13 4 49.26	1.877	5 42 37.0	11.84	1 42.1	12	13 28 27.25	2.035	8 7 26.6	12.08	0 7.7					
13	13 5 34.39	1.885	5 47 21.6	11.87	1 38.9	13	13 29 16.13	2.037	8 12 16.4	12.07	0 4.6					
14	13 6 19.70	1.892	5 52 6.9	11.90	1 35.7	14	13 30 5.05	2.039	8 17 5.9	12.06	0 1.4					
15	13 7 5.20	1.899	5 56 52.8	11.92	1 32.6	15	13 30 54.02	2.041	8 21 55.0	12.04	23 55.2					
16	13 7 50.87	+ 1.906	- 6 1 39.3	- 11.95	1 29.4	16	13 31 43.04	+ 2.043	- 8 26 43.6	- 12.02	23 52.1					
17	13 8 36.71	1.913	6 6 26.3	11.97	1 26.2	17	13 32 32.11	2.045	8 31 31.8	12.00	23 48.9					
18	13 9 22.72	1.920	6 11 13.8	11.99	1 23.0	18	13 33 21.21	2.047	8 36 19.5	11.98	23 45.8					
19	13 10 8.90	1.927	6 16 1.8	12.01	1 19.9	19	13 34 10.35	2.049	8 41 6.7	11.96	23 42.7					
20	13 10 55.23	1.934	6 20 50.2	12.03	1 16.7	20	13 34 59.53	2.050	8 45 53.4	11.94	23 39.6					
21	13 11 41.72	+ 1.940	- 6 25 39.0	- 12.04	1 13.5	21	13 35 48.73	+ 2.051	- 8 50 39.5	- 11.91	23 36.5					
22	13 12 28.37	1.946	6 30 28.2	12.06	1 10.4	22	13 36 37.95	2.051	8 55 25.0	11.89	23 33.4					
23	13 13 15.17	1.952	6 35 17.9	12.08	1 7.3	23	13 37 27.18	2.052	9 0 9.9	11.87	23 30.3					
24	13 14 2.12	1.958	6 40 7.9	12.09	1 4.1	24	13 38 16.43	2.052	9 4 54.2	11.84	23 27.2					
25	13 14 49.21	1.964	6 44 58.2	12.10	1 0.9	25	13 39 5.69	2.052	9 9 37.9	11.81	23 24.1					
26	13 15 36.44	+ 1.970	- 6 49 48.7	- 12.11	0 57.8	26	13 39 54.96	+ 2.053	- 9 14 20.9	- 11.78	23 21.0					
27	13 16 23.80	1.976	6 54 39.5	12.12	0 54.7	27	13 40 44.22	2.053	9 19 3.1	11.75	23 17.9					
28	13 17 11.29	1.981	6 59 30.6	12.12	0 51.5	28	13 41 33.47	2.052	9 23 44.5	11.72	23 14.8					
29	13 17 58.91	1.986	7 4 21.8	12.13	0 48.3	29	13 42 22.72	2.052	9 28 25.2	11.68	23 11.7					
30	13 18 46.66	1.991	7 9 13.1	12.13	0 45.2	30	13 43 11.96	2.051	9 33 5.0	11.64	23 8.6					
31	13 19 34.53	+ 1.996	- 7 14 4.5	- 12.14	0 42.1	31	13 44 1.17	+ 2.050	- 9 37 43.9	- 11.60	23 5.5					
32	13 20 22.50	+ 2.001	- 7 18 56.0	- 12.14	0 38.9	32	13 44 50.35	+ 2.049	- 9 42 21.8	- 11.56	23 2.3					
Day of the Month.					7th.	15th.	23d.	Day of the Month.					1st.	9th.	17th.	25th.
					"	"	"						"	"	"	"
Semidiameter . . . . .					15.00	14.86	14.75	Semidiameter . . . . .					14.67	14.62	14.61	14.62
Horizontal Parallax . . . . .					1.40	1.39	1.38	Horizontal Parallax . . . . .					1.37	1.37	1.37	1.37

## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	13 44 50.35	+2.049	-9 42 21.8	-11.56	23 2.3	1	14 8 46.53	+1.907	-11 51 49.4	-9.85	21 28.1
2	13 45 39.49	2.047	9 46 58.8	11.52	22 59.2	2	14 9 32.19	1.898	11 55 44.6	9.77	21 24.9
3	13 46 28.60	2.045	9 51 34.9	11.48	22 56.1	3	14 10 17.65	1.889	11 59 37.9	9.69	21 21.7
4	13 47 17.66	2.043	9 56 10.0	11.44	22 53.0	4	14 11 2.90	1.880	12 3 29.4	9.61	21 18.6
5	13 48 6.68	2.040	10 0 44.0	11.40	22 49.8	5	14 11 47.93	1.871	12 7 19.1	9.53	21 15.4
6	13 48 55.64	+2.038	-10 5 17.0	-11.35	22 46.7	6	14 12 32.72	+1.861	-12 11 6.8	-9.45	21 12.2
7	13 49 44.54	2.036	10 9 48.9	11.30	22 43.6	7	14 13 17.28	1.851	12 14 52.5	9.37	21 9.0
8	13 50 33.37	2.033	10 14 19.6	11.25	22 40.5	8	14 14 1.60	1.841	12 18 36.1	9.29	21 5.8
9	13 51 22.13	2.030	10 18 49.1	11.20	22 37.3	9	14 14 45.67	1.831	12 22 17.7	9.20	21 2.6
10	13 52 10.82	2.027	10 23 17.5	11.15	22 34.2	10	14 15 29.48	1.820	12 25 57.3	9.11	20 59.3
11	13 52 59.43	+2.024	-10 27 44.7	-11.10	22 31.1	11	14 16 13.04	+1.809	-12 29 34.9	-9.03	20 56.1
12	13 53 47.94	2.020	10 32 10.6	11.05	22 28.0	12	14 16 56.34	1.798	12 33 10.5	8.94	20 52.9
13	13 54 36.36	2.016	10 36 35.2	11.00	22 24.8	13	14 17 39.36	1.787	12 36 44.1	8.85	20 49.7
14	13 55 24.68	2.012	10 40 58.5	10.94	22 21.7	14	14 18 22.10	1.775	12 40 15.5	8.76	20 46.5
15	13 56 12.90	2.007	10 45 20.4	10.88	22 18.6	15	14 19 4.56	1.763	12 43 44.7	8.67	20 43.2
16	13 57 1.02	+2.002	-10 49 40.9	-10.82	22 15.4	16	14 19 46.73	+1.751	-12 47 11.7	-8.58	20 40.0
17	13 57 49.03	1.997	10 54 0.1	10.76	22 12.2	17	14 20 28.61	1.739	12 50 36.6	8.49	20 36.8
18	13 58 36.95	1.992	10 58 17.9	10.70	22 9.1	18	14 21 10.18	1.726	12 53 59.3	8.40	20 33.5
19	13 59 24.73	1.987	11 2 34.3	10.64	22 6.0	19	14 21 51.44	1.713	12 57 19.8	8.31	20 30.2
20	14 0 12.38	1.982	11 6 49.2	10.59	22 2.9	20	14 22 32.39	1.700	13 0 38.1	8.21	20 27.0
21	14 0 59.89	+1.976	-11 11 2.6	-10.53	21 59.7	21	14 23 13.02	+1.686	-13 3 54.0	-8.12	20 23.8
22	14 1 47.27	1.970	11 15 14.6	10.47	21 56.6	22	14 23 53.31	1.672	13 7 7.6	8.03	20 20.5
23	14 2 34.51	1.964	11 19 25.1	10.41	21 53.5	23	14 24 33.27	1.658	13 10 19.0	7.93	20 17.2
24	14 3 21.60	1.958	11 23 34.0	10.34	21 50.3	24	14 25 12.88	1.643	13 13 28.1	7.83	20 13.9
25	14 4 8.53	1.952	11 27 41.2	10.27	21 47.1	25	14 25 52.14	1.628	13 16 34.8	7.73	20 10.6
26	14 4 55.31	+1.945	-11 31 46.8	-10.20	21 44.0	26	14 26 31.03	+1.613	-13 19 39.1	-7.63	20 7.3
27	14 5 41.92	1.938	11 35 50.9	10.13	21 40.8	27	14 27 9.55	1.597	13 22 41.0	7.53	20 4.0
28	14 6 28.35	1.931	11 39 53.2	10.06	21 37.6	28	14 27 47.71	1.581	13 25 40.5	7.43	20 0.7
29	14 7 14.60	1.923	11 43 53.7	9.99	21 34.4	29	14 28 25.48	1.565	13 28 37.5	7.33	19 57.4
30	14 8 0.66	1.915	11 47 52.4	9.92	21 31.3	30	14 29 2.85	1.549	13 31 31.9	7.22	19 54.1
31	14 8 46.53	+1.907	-11 51 49.4	-9.85	21 28.1	31	14 29 39.82	+1.532	-13 34 23.9	-7.11	19 50.7
32	14 9 32.19	+1.898	-11 55 44.6	-9.77	21 24.9	32	14 30 16.39	+1.515	-13 37 13.4	-7.01	19 47.4

Day of the Month.	2d.	10th.	18th.	26th.	Day of the Month.	4th.	12th.	20th.	28th.	36th.
Semidiameter . . . . .	14.67	14.75	14.86	15.01	Semidiameter . . . . .	15.18	15.39	15.63	15.91	16.23
Horizontal Parallax . . . .	1.37	1.38	1.39	1.40	Horizontal Parallax . . . .	1.42	1.44	1.46	1.49	1.52

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	I 4 47.25	+ 0.196	+ 4 9 23.1	+ 1.97	6 22.7	1	I 10 17.76	+ 0.674	+ 4 52 3.8	+ 4.77	4 26.3
2	I 4 52.16	0.213	4 10 11.6	2.07	6 18.9	2	I 10 34.08	0.687	4 53 58.8	4.84	4 22.6
3	I 4 57.48	0.230	4 11 2.5	2.17	6 15.0	3	I 10 50.73	0.700	4 55 55.6	4.91	4 19.0
4	I 5 3.20	0.247	4 11 55.8	2.27	6 11.2	4	I 11 7.69	0.713	4 57 54.2	4.98	4 15.3
5	I 5 9.32	0.263	4 12 51.6	2.37	6 7.4	5	I 11 24.95	0.726	4 59 54.4	5.05	4 11.7
6	I 5 15.83	+ 0.280	+ 4 13 49.8	+ 2.47	6 3.6	6	I 11 42.52	+ 0.739	+ 5 1 56.3	+ 5.12	4 8.1
7	I 5 22.74	0.297	4 14 50.4	2.57	5 59.8	7	I 12 0.40	0.752	5 3 59.9	5.19	4 4.5
8	I 5 30.05	0.314	4 15 53.4	2.67	5 56.0	8	I 12 18.58	0.765	5 6 5.1	5.26	4 0.8
9	I 5 37.76	0.330	4 16 58.8	2.77	5 52.1	9	I 12 37.06	0.777	5 8 11.9	5.32	3 57.2
10	I 5 45.87	0.346	4 18 6.5	2.87	5 48.3	10	I 12 55.83	0.789	5 10 20.2	5.38	3 53.6
11	I 5 54.36	+ 0.362	+ 4 19 16.6	+ 2.97	5 44.5	11	I 13 14.89	+ 0.801	+ 5 12 30.1	+ 5.44	3 50.0
12	I 6 3.24	0.378	4 20 29.0	3.07	5 40.7	12	I 13 34.24	0.813	5 14 41.5	5.50	3 46.4
13	I 6 12.50	0.394	4 21 43.6	3.16	5 36.9	13	I 13 53.86	0.824	5 16 54.3	5.56	3 42.8
14	I 6 22.15	0.410	4 23 0.5	3.25	5 33.2	14	I 14 13.75	0.835	5 19 8.5	5.62	3 39.2
15	I 6 32.17	0.425	4 24 19.7	3.35	5 29.4	15	I 14 33.92	0.846	5 21 24.1	5.68	3 35.6
16	I 6 42.57	+ 0.441	+ 4 25 41.1	+ 3.44	5 25.6	16	I 14 54.36	+ 0.857	+ 5 23 41.1	+ 5.74	3 32.0
17	I 6 53.35	0.457	4 27 4.7	3.53	5 21.9	17	I 15 15.05	0.868	5 25 59.4	5.80	3 28.4
18	I 7 4.52	0.473	4 28 30.4	3.62	5 18.2	18	I 15 36.00	0.879	5 28 19.0	5.85	3 24.8
19	I 7 16.05	0.488	4 29 58.3	3.71	5 14.4	19	I 15 57.20	0.889	5 30 39.9	5.90	3 21.2
20	I 7 27.94	0.503	4 31 28.3	3.79	5 10.6	20	I 16 18.65	0.899	5 33 2.0	5.95	3 17.6
21	I 7 40.18	+ 0.518	+ 4 33 0.4	+ 3.88	5 6.9	21	I 16 40.34	+ 0.909	+ 5 35 25.3	+ 6.00	3 14.0
22	I 7 52.78	0.533	4 34 34.6	3.97	5 3.2	22	I 17 2.27	0.919	5 37 49.7	6.05	3 10.5
23	I 8 5.74	0.548	4 36 10.8	4.05	4 59.5	23	I 17 24.45	0.929	5 40 15.3	6.10	3 7.0
24	I 8 19.05	0.562	4 37 49.0	4.13	4 55.8	24	I 17 46.86	0.938	5 42 42.0	6.14	3 3.4
25	I 8 32.71	0.576	4 39 29.2	4.21	4 52.1	25	I 18 9.49	0.948	5 45 9.8	6.19	2 59.8
26	I 8 46.71	+ 0.590	+ 4 41 11.3	+ 4.29	4 48.4	26	I 18 32.34	+ 0.957	+ 5 47 38.6	+ 6.23	2 56.3
27	I 9 1.05	0.604	4 42 55.4	4.37	4 44.7	27	I 18 55.40	0.966	5 50 8.5	6.27	2 52.8
28	I 9 15.73	0.618	4 44 41.4	4.45	4 41.0	28	I 19 18.67	0.975	5 52 39.3	6.31	2 49.2
29	I 9 30.74	0.632	4 46 29.3	4.53	4 37.3	29	I 19 42.17	0.984	5 55 11.1	6.35	2 45.6
30	I 9 46.09	0.646	4 48 19.0	4.61	4 33.7	30	I 20 5.89	0.993	5 57 43.9	6.39	2 42.1
31	I 10 1.76	+ 0.660	+ 4 50 10.5	+ 4.69	4 30.0	31	I 20 29.82	+ 1.001	+ 6 0 17.7	+ 6.43	2 38.6
32	I 10 17.76	+ 0.674	+ 4 52 3.8	+ 4.77	4 26.3	32	I 20 53.95	+ 1.009	+ 6 2 52.3	+ 6.47	2 35.0
Day of the Month.		2d.	10th.	18th.	26th.	Day of the Month.		8d.	11th.	19th.	27th.
Semidiameter . . . .		8.51	8.40	8.28	8.17	Semidiameter . . . .		8.06	7.96	7.87	7.80
Horizontal Parallax . .		0.96	0.95	0.93	0.92	Horizontal Parallax . .		0.91	0.90	0.89	0.88

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.

## GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	1 19 42.17	+0.984	+5 55 11.1	+6.35	2 45.6	1	1 33 12.99	+1.167	+7 19 2.2	+6.98	0 57.2
2	1 20 5.89	0.993	5 57 43.9	6.39	2 42.1	2	1 33 41.04	1.170	7 21 49.8	6.98	0 53.7
3	1 20 29.82	1.001	6 0 17.7	6.43	2 38.6	3	1 34 9.17	1.173	7 24 37.5	6.99	0 50.2
4	1 20 53.95	1.009	6 2 52.3	6.47	2 35.0	4	1 34 37.37	1.176	7 27 25.2	6.99	0 46.8
5	1 21 18.26	1.017	6 5 27.7	6.50	2 31.5	5	1 35 5.64	1.179	7 30 12.9	6.99	0 43.3
6	1 21 42.76	+1.025	+6 8 4.0	+6.53	2 28.0	6	1 35 33.97	+1.182	+7 33 0.5	+6.98	0 39.8
7	1 22 7.45	1.033	6 10 41.1	6.56	2 24.5	7	1 36 2.35	1.184	7 35 48.1	6.98	0 36.3
8	1 22 32.33	1.041	6 13 19.0	6.59	2 20.9	8	1 36 30.79	1.186	7 38 35.7	6.98	0 32.9
9	1 22 57.39	1.048	6 15 57.6	6.62	2 17.4	9	1 36 59.28	1.188	7 41 23.2	6.97	0 29.4
10	1 23 22.62	1.055	6 18 36.9	6.65	2 13.9	10	1 37 27.81	1.190	7 44 10.5	6.97	0 25.9
11	1 23 48.01	+1.062	+6 21 17.0	+6.68	2 10.4	11	1 37 56.38	+1.191	+7 46 57.6	+6.96	0 22.5
12	1 24 13.58	1.069	6 23 57.7	6.71	2 6.9	12	1 38 24.99	1.192	7 49 44.4	6.95	0 19.1
13	1 24 39.31	1.076	6 26 39.0	6.74	2 3.4	13	1 38 53.63	1.193	7 52 31.1	6.94	0 15.6
14	1 25 5.19	1.082	6 29 20.9	6.76	1 59.9	14	1 39 22.29	1.194	7 55 17.5	6.93	0 12.1
15	1 25 31.23	1.088	6 32 3.4	6.78	1 56.4	15	1 39 50.97	1.195	7 58 3.6	6.92	0 8.7
16	1 25 57.42	+1.094	+6 34 46.4	+6.80	1 52.9	16	1 40 19.68	+1.195	+8 0 49.4	+6.91	0 5.3
17	1 26 23.75	1.100	6 37 29.9	6.82	1 49.4	17	1 40 48.40	1.196	8 3 34.9	6.90	0 1.9
18	1 26 50.22	1.106	6 40 13.8	6.84	1 45.9	18	1 41 17.12	1.196	8 6 20.0	6.88	23 55.0
19	1 27 16.83	1.112	6 42 58.2	6.86	1 42.4	19	1 41 45.85	1.197	8 9 4.7	6.86	23 51.5
20	1 27 43.57	1.117	6 45 42.9	6.88	1 38.9	20	1 42 14.58	1.197	8 11 49.0	6.84	23 48.1
21	1 28 10.43	+1.122	+6 48 28.0	+6.89	1 35.4	21	1 42 43.31	+1.197	+8 14 32.9	+6.82	23 44.7
22	1 28 37.41	1.127	6 51 13.5	6.90	1 31.9	22	1 43 12.03	1.196	8 17 16.3	6.80	23 41.2
23	1 29 4.51	1.132	6 53 59.5	6.91	1 28.5	23	1 43 40.74	1.196	8 19 59.3	6.78	23 37.7
24	1 29 31.72	1.137	6 56 45.7	6.92	1 25.0	24	1 44 9.44	1.195	8 22 41.8	6.76	23 34.3
25	1 29 59.04	1.141	6 59 32.1	6.93	1 21.5	25	1 44 38.12	1.195	8 25 23.8	6.74	23 30.8
26	1 30 26.46	+1.145	+7 2 18.7	+6.94	1 18.0	26	1 45 6.78	+1.194	+8 28 5.2	+6.72	23 27.3
27	1 30 53.98	1.149	7 5 5.6	6.95	1 14.6	27	1 45 35.41	1.193	8 30 46.1	6.70	23 23.8
28	1 31 21.61	1.153	7 7 52.7	6.96	1 11.1	28	1 46 4.02	1.192	8 33 26.5	6.68	23 20.4
29	1 31 49.33	1.157	7 10 39.9	6.97	1 7.6	29	1 46 32.60	1.190	8 36 6.2	6.65	23 17.0
30	1 32 17.13	1.161	7 13 27.2	6.98	1 4.1	30	1 47 1.14	1.188	8 38 45.3	6.62	23 13.5
31	1 32 45.02	+1.164	+7 16 14.6	+6.98	1 0.7	31	1 47 29.63	+1.186	+8 41 23.8	+6.59	23 10.0
32	1 33 12.99	+1.167	+7 19 2.2	+6.98	0 57.2	32	1 47 58.08	+1.184	+8 44 1.7	+6.56	23 6.6
Day of the Month.						Day of the Month.					
7th. 15th. 23d. 31st.						8th. 16th. 24th.					
Semidiameter . . . . .						Semidiameter . . . . .					
Horizontal Parallax . . . . .						Horizontal Parallax . . . . .					
7.74 7.69 7.65 7.62						7.60 7.59 7.60					
0.87 0.87 0.86 0.86						0.86 0.85 0.86					

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign - indicates that north declinations are decreasing or south declinations increasing.



## GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	2 12 28.72	+0.758	+10 48 53.9	+3.41	19 34.9	1	2 19 15.68	+0.316	+11 16 9.4	+0.94	17 39.6
2	2 12 46.77	0.746	10 50 14.8	3.34	19 31.3	2	2 19 23.06	0.300	11 16 30.8	0.85	17 35.8
3	2 13 4.52	0.734	10 51 33.9	3.27	19 27.7	3	2 19 30.04	0.284	11 16 50.2	0.77	17 32.0
4	2 13 21.97	0.721	10 52 51.2	3.19	19 24.0	4	2 19 36.63	0.267	11 17 7.5	0.68	17 28.2
5	2 13 39.12	0.708	10 54 6.7	3.11	19 20.4	5	2 19 42.83	0.250	11 17 22.7	0.59	17 24.3
6	2 13 55.96	+0.695	+10 55 20.4	+3.03	19 16.7	6	2 19 48.64	+0.234	+11 17 35.8	+0.51	17 20.5
7	2 14 12.49	0.682	10 56 32.3	2.96	19 13.0	7	2 19 54.04	0.218	11 17 46.9	0.42	17 16.7
8	2 14 28.71	0.669	10 57 42.4	2.88	19 9.3	8	2 19 59.04	0.201	11 17 55.9	0.34	17 12.8
9	2 14 44.62	0.656	10 58 50.6	2.81	19 5.7	9	2 20 3.64	0.184	11 18 2.9	0.25	17 8.9
10	2 15 0.20	0.643	10 59 57.0	2.73	19 2.0	10	2 20 7.84	0.167	11 18 7.9	0.16	17 5.1
11	2 15 15.46	+0.629	+11 1 1.5	+2.65	18 58.3	11	2 20 11.64	+0.150	+11 18 10.7	+0.08	17 1.2
12	2 15 30.39	0.615	11 2 4.0	2.57	18 54.6	12	2 20 15.03	0.133	11 18 11.5	-0.01	16 57.3
13	2 15 44.99	0.601	11 3 4.6	2.49	18 50.9	13	2 20 18.02	0.116	11 18 10.3	0.09	16 53.4
14	2 15 59.26	0.587	11 4 3.4	2.41	18 47.2	14	2 20 20.61	0.099	11 18 7.1	0.18	16 49.5
15	2 16 13.19	0.573	11 5 0.3	2.33	18 43.5	15	2 20 22.79	0.082	11 18 1.8	0.26	16 45.6
16	2 16 26.78	+0.559	+11 5 55.3	+2.25	18 39.8	16	2 20 24.56	+0.066	+11 17 54.5	-0.35	16 41.7
17	2 16 40.03	0.545	11 6 48.4	2.17	18 36.1	17	2 20 25.93	0.049	11 17 45.1	0.43	16 37.8
18	2 16 52.93	0.530	11 7 39.5	2.09	18 32.4	18	2 20 26.89	0.032	11 17 33.7	0.52	16 33.9
19	2 17 5.48	0.515	11 8 28.7	2.01	18 28.7	19	2 20 27.45	+0.015	11 17 20.3	0.60	16 30.0
20	2 17 17.68	0.500	11 9 16.0	1.93	18 24.9	20	2 20 27.60	-0.002	11 17 4.9	0.68	16 26.0
21	2 17 29.53	+0.485	+11 10 1.3	+1.85	18 21.2	21	2 20 27.34	-0.019	+11 16 47.5	-0.77	16 22.0
22	2 17 41.02	0.470	11 10 44.7	1.77	18 17.5	22	2 20 26.67	0.036	11 16 28.1	0.85	16 18.1
23	2 17 52.15	0.455	11 11 26.1	1.69	18 13.7	23	2 20 25.60	0.053	11 16 6.7	0.94	16 14.2
24	2 18 2.92	0.440	11 12 5.5	1.61	18 9.9	24	2 20 24.12	0.070	11 15 43.3	1.02	16 10.2
25	2 18 13.32	0.425	11 12 43.0	1.53	18 6.2	25	2 20 22.24	0.087	11 15 17.9	1.10	16 6.2
26	2 18 23.36	+0.410	+11 13 18.5	+1.44	18 2.4	26	2 20 19.95	-0.104	+11 14 50.5	-1.19	16 2.3
27	2 18 33.02	0.395	11 13 52.0	1.36	17 58.6	27	2 20 17.25	0.121	11 14 21.2	1.27	15 58.3
28	2 18 42.31	0.380	11 14 23.5	1.28	17 54.8	28	2 20 14.15	0.138	11 13 49.9	1.35	15 54.3
29	2 18 51.23	0.364	11 14 53.0	1.19	17 51.0	29	2 20 10.65	0.155	11 13 16.7	1.43	15 50.3
30	2 18 59.76	0.348	11 15 20.5	1.11	17 47.2	30	2 20 6.74	0.171	11 12 41.5	1.51	15 46.3
31	2 19 7.91	+0.332	+11 15 46.0	+1.02	17 43.4	31	2 20 2.42	-0.188	+11 12 4.4	-1.59	15 42.3
32	2 19 15.68	+0.316	+11 16 9.4	+0.94	17 39.6	32	2 19 57.70	-0.205	+11 11 25.4	-1.67	15 38.3
Day of the Month.						Day of the Month.					
5th.						6th.					
18th.						14th.					
21st.						22d.					
29th.						30th.					
Semidiameter . . . . .						Semidiameter . . . . .					
Horizontal Parallax . . . . .						Horizontal Parallax . . . . .					
8.13 8.24 8.36 8.47						8.60 8.73 8.85 8.97					
0.92 0.93 0.94 0.95						0.97 0.98 1.00 1.01					

## GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.										
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.					
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.						
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m					
1	2 19 57.70	-0.205	+ 11 11 25.4	-1.67	15 38.3	1	2 14 47.72	-0.626	+ 10 38 50.5	-3.59	13 35.1					
2	2 19 52.59	0.221	11 10 44.4	1.75	15 34.2	2	2 14 32.57	0.636	10 37 23.9	3.63	13 30.9					
3	2 19 47.08	0.237	11 10 1.5	1.83	15 30.2	3	2 14 17.18	0.646	10 35 56.3	3.67	13 26.7					
4	2 19 41.18	0.254	11 9 16.7	1.90	15 26.2	4	2 14 1.56	0.656	10 34 27.7	3.71	13 22.5					
5	2 19 34.89	0.270	11 8 30.1	1.98	15 22.2	5	2 13 45.71	0.665	10 32 58.2	3.75	13 18.3					
6	2 19 28.22	-0.286	+ 11 7 41.7	-2.06	15 18.1	6	2 13 29.64	-0.674	+ 10 31 27.9	-3.78	13 14.1					
7	2 19 21.17	0.302	11 6 51.4	2.14	15 14.1	7	2 13 13.36	0.682	10 29 56.8	3.81	13 9.9					
8	2 19 13.73	0.318	11 5 59.3	2.21	15 10.0	8	2 12 56.89	0.690	10 28 25.0	3.84	13 5.7					
9	2 19 5.91	0.334	11 5 5.5	2.28	15 5.9	9	2 12 40.23	0.698	10 26 52.4	3.87	13 1.5					
10	2 18 57.72	0.349	11 4 10.0	2.35	15 1.8	10	2 12 23.38	0.705	10 25 19.1	3.90	12 57.3					
11	2 18 49.16	-0.364	+ 11 3 12.8	-2.42	14 57.8	11	2 12 6.37	-0.712	+ 10 23 45.2	-3.92	12 53.1					
12	2 18 40.23	0.379	11 2 13.8	2.49	14 53.7	12	2 11 49.20	0.718	10 22 10.8	3.94	12 48.9					
13	2 18 30.94	0.394	11 1 13.2	2.55	14 49.6	13	2 11 31.88	0.724	10 20 35.9	3.96	12 44.7					
14	2 18 21.29	0.409	11 0 11.0	2.61	14 45.5	14	2 11 14.42	0.730	10 19 0.5	3.98	12 40.5					
15	2 18 11.29	0.424	10 59 7.2	2.68	14 41.4	15	2 10 56.83	0.735	10 17 24.7	4.00	12 36.3					
16	2 18 0.95	-0.439	+ 10 58 1.8	-2.75	14 37.3	16	2 10 39.10	-0.740	+ 10 15 48.6	-4.01	12 32.0					
17	2 17 50.27	0.453	10 56 54.8	2.82	14 33.2	17	2 10 21.25	0.745	10 14 12.1	4.02	12 27.8					
18	2 17 39.25	0.467	10 55 46.3	2.88	14 29.1	18	2 10 3.30	0.749	10 12 35.3	4.03	12 23.6					
19	2 17 27.89	0.481	10 54 36.3	2.94	14 25.0	19	2 9 45.27	0.753	10 10 58.4	4.04	12 19.3					
20	2 17 16.20	0.494	10 53 24.8	3.00	14 20.9	20	2 9 27.15	0.756	10 9 21.4	4.04	12 15.0					
21	2 17 4.20	-0.507	+ 10 52 11.9	-3.06	14 16.7	21	2 9 8.94	-0.759	+ 10 7 44.2	-4.04	12 10.8					
22	2 16 51.89	0.520	10 50 57.6	3.12	14 12.5	22	2 8 50.66	0.762	10 6 6.9	4.05	12 6.6					
23	2 16 39.26	0.533	10 49 41.9	3.18	14 8.4	23	2 8 32.33	0.764	10 4 29.6	4.05	12 2.4					
24	2 16 26.32	0.545	10 48 24.8	3.24	14 4.3	24	2 8 13.96	0.766	10 2 52.4	4.05	11 58.1					
25	2 16 13.08	0.557	10 47 6.4	3.29	14 0.1	25	2 7 55.54	0.767	10 1 15.2	4.04	11 53.9					
26	2 15 59.55	-0.569	+ 10 45 46.8	-3.34	13 55.9	26	2 7 37.09	-0.768	+ 9 59 38.2	-4.03	11 49.7					
27	2 15 45.73	0.581	10 44 25.9	3.39	13 51.8	27	2 7 18.64	0.768	9 58 1.5	4.02	11 45.5					
28	2 15 31.63	0.593	10 43 3.7	3.44	13 47.6	28	2 7 0.18	0.769	9 56 25.0	4.00	11 41.2					
29	2 15 17.26	0.604	10 41 40.4	3.49	13 43.4	29	2 6 41.71	0.769	9 54 48.7	3.98	11 36.9					
30	2 15 2.62	0.615	10 40 16.0	3.54	13 39.2	30	2 6 23.25	0.768	9 53 12.8	3.97	11 32.7					
31	2 14 47.72	-0.626	+ 10 38 50.5	-3.59	13 35.1	31	2 6 4.83	-0.767	+ 9 51 37.4	-3.95	11 28.5					
32	2 14 32.57	-0.636	+ 10 37 23.9	-3.63	13 30.9	32	2 5 46.45	-0.765	+ 9 50 2.5	-3.93	11 24.2					
Day of the Month.					7th.	15th.	23d.	Day of the Month.					1st.	9th.	17th.	25th.
Semidiameter . . . . .					9.08	9.18	9.27	Semidiameter . . . . .					9.35	9.42	9.46	9.48
Horizontal Parallax . . . . .					1.02	1.03	1.04	Horizontal Parallax . . . . .					1.05	1.06	1.07	1.07

NOTE.—The sign + indicates north declinations; the sign — indicates south declinations.



## GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.												
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.							
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.								
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m							
1	2 5 46.45	-0.765	+9 50 2.5	-3.93	11 24.2	1	1 57 41.16	-0.528	+9 10 48.0	-2.31	9 18.2							
2	2 5 28.12	0.763	9 48 28.2	3.91	11 20.0	2	1 57 28.66	0.515	9 9 53.6	2.23	9 14.1							
3	2 5 9.84	0.760	9 46 54.5	3.89	11 15.8	3	1 57 16.48	0.501	9 9 1.1	2.15	9 9.9							
4	2 4 51.63	0.757	9 45 21.5	3.86	11 11.5	4	1 57 4.62	0.487	9 8 10.6	2.07	9 5.8							
5	2 4 33.50	0.753	9 43 49.2	3.83	11 7.3	5	1 56 53.11	0.473	9 7 22.2	1.98	9 1.7							
6	2 4 15.46	-0.749	+9 42 17.6	-3.79	11 3.0	6	1 56 41.94	-0.458	+9 6 35.9	-1.89	8 57.6							
7	2 3 57.52	0.745	9 40 46.8	3.75	10 58.8	7	1 56 31.11	0.443	9 5 51.7	1.80	8 53.5							
8	2 3 39.70	0.740	9 39 17.0	3.71	10 54.5	8	1 56 20.63	0.428	9 5 9.7	1.71	8 49.4							
9	2 3 21.99	0.734	9 37 48.2	3.67	10 50.3	9	1 56 10.51	0.414	9 4 29.8	1.62	8 45.3							
10	2 3 4.40	0.728	9 36 20.4	3.63	10 46.1	10	1 56 0.76	0.399	9 3 52.1	1.53	8 41.2							
11	2 2 46.96	-0.722	+9 34 53.6	-3.59	10 41.9	11	1 55 51.37	-0.384	+9 3 16.6	-1.44	8 37.1							
12	2 2 29.68	0.716	9 33 27.9	3.54	10 37.7	12	1 55 42.35	0.368	9 2 43.3	1.35	8 33.0							
13	2 2 12.55	0.710	9 32 3.3	3.49	10 33.5	13	1 55 33.71	0.352	9 2 12.2	1.25	8 28.9							
14	2 1 55.59	0.703	9 30 39.9	3.44	10 29.3	14	1 55 25.45	0.336	9 1 43.4	1.16	8 24.8							
15	2 1 38.80	0.695	9 29 17.8	3.39	10 25.0	15	1 55 17.57	0.320	9 1 16.9	1.07	8 20.8							
16	2 1 22.20	-0.687	+9 27 57.0	-3.34	10 20.8	16	1 55 10.06	-0.304	+9 0 52.7	-0.97	8 16.8							
17	2 1 5.80	0.679	9 26 37.5	3.29	10 16.6	17	1 55 2.94	0.288	9 0 30.7	0.87	8 12.7							
18	2 0 49.59	0.671	9 25 19.3	3.23	10 12.4	18	1 54 56.22	0.272	9 0 11.0	0.77	8 8.7							
19	2 0 33.59	0.662	9 24 2.5	3.17	10 8.2	19	1 54 49.90	0.256	8 59 53.7	0.68	8 4.6							
20	2 0 17.82	0.653	9 22 47.2	3.11	10 4.0	20	1 54 43.98	0.239	8 59 38.7	0.58	8 0.6							
21	2 0 2.28	-0.643	+9 21 33.5	-3.05	9 59.8	21	1 54 38.46	-0.222	+8 59 26.1	-0.48	7 56.6							
22	1 59 46.97	0.633	9 20 21.3	2.98	9 55.7	22	1 54 33.34	0.205	8 59 15.9	0.38	7 52.6							
23	1 59 31.90	0.622	9 19 10.7	2.91	9 51.5	23	1 54 28.63	0.188	8 59 8.0	0.28	7 48.6							
24	1 59 17.09	0.611	9 18 1.7	2.84	9 47.3	24	1 54 24.34	0.171	8 59 2.4	0.19	7 44.6							
25	1 59 2.54	0.600	9 16 54.4	2.77	9 43.1	25	1 54 20.46	0.154	8 58 59.1	-0.09	7 40.6							
26	1 58 48.26	-0.589	+9 15 48.8	-2.70	9 39.0	26	1 54 16.99	-0.137	+8 58 58.2	+0.01	7 36.6							
27	1 58 34.25	0.578	9 14 45.0	2.63	9 34.8	27	1 54 13.93	0.119	8 58 59.6	0.11	7 32.6							
28	1 58 20.53	0.566	9 13 43.0	2.55	9 30.7	28	1 54 11.29	0.101	8 59 3.4	0.21	7 28.6							
29	1 58 7.11	0.554	9 12 42.8	2.47	9 26.5	29	1 54 9.08	0.084	8 59 9.8	0.31	7 24.6							
30	1 57 53.98	0.541	9 11 44.4	2.39	9 22.4	30	1 54 7.29	0.067	8 59 18.6	0.41	7 20.6							
31	1 57 41.16	-0.528	+9 10 48.0	-2.31	9 18.2	31	1 54 5.92	-0.049	+8 59 29.8	+0.51	7 16.7							
32	1 57 28.66	-0.515	+9 9 53.6	-2.23	9 14.1	32	1 54 4.97	-0.031	+8 59 43.3	+0.61	7 12.8							
Day of the Month.					2d.	10th.	18th.	26th.	Day of the Month.					4th.	12th.	20th.	28th.	36th.
Semidiameter . . . . .					9.46	9.44	9.39	9.32	Semidiameter . . . . .					9.23	9.12	9.01	8.89	8.77
Horizontal Parallax . . . . .					1.07	1.06	1.06	1.05	Horizontal Parallax . . . . .					1.04	1.03	1.01	1.00	1.00

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations are decreasing. The sign — indicates that north declinations are decreasing or south declinations increasing.

## GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.			Var. of R. A. for 1 Day.			Apparent Declination.			Var. of Decl. for 1 Day.			Meridian Passage.								
	Noon.			Noon.			Noon.			Noon.											
	h	m	s	s	°	'	"	"	h	m											
Jan. 2	19	29	19.17	+15.055	-22	19	3.9	+31.74	0	44.2	July 1	19	43	17.01	-9.737	-21	51	21.6	-24.71	13	6.4
6	19	30	19.60	15.150	22	16	55.9	32.25	0	29.5	5	19	42	37.58	9.967	21	53	1.2	25.01	12	50.0
10	19	31	20.30	15.200	22	14	46.2	32.57	0	14.8	9	19	41	57.37	10.125	21	54	41.7	25.13	12	33.6
14	19	32	21.09	15.187	22	12	35.3	32.80	0	0.1	13	19	41	16.67	10.215	21	56	22.3	25.07	12	17.2
18	19	33	21.72	15.120	22	10	23.7	32.93	23	41.7	17	19	40	35.74	10.239	21	58	2.3	24.86	12	0.8
22	19	34	21.98	+15.002	-22	8	11.8	+32.95	23	26.9	21	19	39	54.85	-10.197	-21	59	41.2	-24.49	11	44.4
26	19	35	21.67	14.838	22	6	0.1	32.84	23	12.2	25	19	39	14.25	10.092	22	1	18.2	23.95	11	28.0
30	19	36	20.62	14.628	22	3	49.1	32.61	22	57.4	29	19	38	34.00	9.921	22	2	52.7	23.26	11	11.6
Feb. 3	19	37	18.63	14.368	22	1	39.2	32.26	22	42.7	Aug. 2	19	37	54.97	9.681	22	4	24.1	22.43	10	55.2
7	19	38	15.50	14.058	21	59	31.0	31.77	22	27.9	6	19	37	16.84	9.372	22	5	52.0	21.46	10	38.9
11	19	39	11.03	+13.698	-21	57	25.1	+31.14	22	13.1	10	19	36	40.07	-9.001	-22	7	15.9	-20.37	10	22.6
15	19	40	5.02	13.291	21	55	21.9	30.38	21	58.3	14	19	36	4.91	8.571	22	8	35.2	19.16	10	6.3
19	19	40	57.29	12.836	21	53	22.0	29.50	21	43.5	18	19	35	31.58	8.086	22	9	49.4	17.85	9	50.0
23	19	41	47.67	12.345	21	51	26.0	28.46	21	28.5	22	19	35	0.29	7.548	22	10	58.1	16.45	9	33.7
27	19	42	36.00	11.815	21	49	34.3	27.32	21	13.5	26	19	34	31.26	6.963	22	12	1.1	14.96	9	17.5
Mar. 3	19	43	22.13	+11.245	-21	47	47.4	+26.07	20	58.6	30	19	34	4.65	-6.332	-22	12	57.8	-13.39	9	1.3
7	19	44	5.91	10.636	21	46	5.7	24.70	20	43.6	Sept. 3	19	33	40.67	5.650	22	13	48.2	11.74	8	45.2
11	19	44	47.17	9.988	21	44	29.8	23.20	20	28.5	7	19	33	19.51	4.924	22	14	31.7	10.01	8	29.1
15	19	45	25.77	9.305	21	43	0.1	21.59	20	13.4	11	19	33	1.32	4.166	22	15	8.3	8.25	8	13.1
19	19	46	1.57	8.590	21	41	37.0	19.88	19	58.3	15	19	32	46.22	3.380	22	15	37.7	6.44	7	57.2
23	19	46	34.46	+7.851	-21	40	21.0	+18.07	19	43.1	19	19	32	34.31	-2.572	-22	15	59.8	-4.59	7	41.2
27	19	47	4.35	7.092	21	39	12.4	16.17	19	27.8	23	19	32	25.67	1.744	22	16	14.4	2.73	7	25.4
31	19	47	31.15	6.310	21	38	11.5	14.21	19	12.5	27	19	32	20.38	0.898	22	16	21.6	-0.84	7	9.6
Apr. 4	19	47	54.78	5.502	21	37	18.7	12.17	18	57.1	Oct. 1	19	32	18.51	-0.033	22	16	21.1	+1.09	6	53.8
8	19	48	15.15	4.678	21	36	34.2	10.07	18	41.8	5	19	32	20.13	+0.842	22	16	12.9	3.01	6	38.1
12	19	48	32.18	+3.835	-21	35	58.1	+7.94	18	26.3	9	19	32	25.25	+1.718	-22	15	57.0	+4.95	6	22.5
16	19	48	45.83	2.966	21	35	30.7	5.75	18	10.8	13	19	32	33.87	2.590	22	15	33.3	6.89	6	6.9
20	19	48	56.07	2.132	21	35	12.1	3.56	17	55.2	17	19	32	45.96	3.454	22	15	1.9	8.80	5	51.4
24	19	49	2.90	1.283	21	35	2.2	+1.36	17	39.6	21	19	33	1.49	4.308	22	14	22.9	10.69	5	35.9
28	19	49	6.33	+0.435	21	35	1.2	-0.84	17	23.9	25	19	33	20.42	5.152	22	13	36.4	12.57	5	20.5
May 2	19	49	6.36	-0.415	-21	35	8.9	-3.01	17	8.2	29	19	33	42.70	+5.984	-22	12	42.4	+14.44	5	5.1
6	19	49	3.01	1.258	21	35	25.3	5.16	16	52.4	Nov. 2	19	34	8.28	6.798	22	11	40.9	16.28	4	49.8
10	19	48	56.31	2.090	21	35	50.2	7.27	16	36.5	6	19	34	37.06	7.586	22	10	32.2	18.08	4	34.6
14	19	48	46.32	2.899	21	36	23.5	9.32	16	20.6	10	19	35	8.92	8.343	22	9	16.3	19.84	4	19.4
18	19	48	33.15	3.682	21	37	4.9	11.30	16	4.7	14	19	35	43.75	9.069	22	7	53.5	21.55	4	4.3
22	19	48	16.90	-4.437	-21	37	53.9	-13.17	15	48.7	18	19	36	21.43	+9.762	-22	6	23.9	+23.24	3	49.2
26	19	47	57.69	5.164	21	38	50.2	14.92	15	32.6	22	19	37	1.81	10.420	22	4	47.6	24.85	3	34.1
30	19	47	35.63	5.860	21	39	53.3	16.57	15	16.5	26	19	37	44.75	11.044	22	3	5.1	26.38	3	19.1
June 3	19	47	10.85	6.522	21	41	2.8	18.11	15	0.4	30	19	38	30.12	11.631	22	1	16.6	27.84	3	4.1
7	19	46	43.51	7.141	21	42	18.2	19.54	14	44.2	Dec. 4	19	39	17.74	12.175	21	59	22.4	29.26	2	49.2
11	19	46	13.79	-7.710	-21	43	39.1	-20.81	14	28.0	8	19	40	7.45	+12.673	-21	57	22.5	+30.62	2	34.3
15	19	45	41.90	8.225	21	45	4.7	21.91	14	11.7	12	19	40	59.06	13.123	21	55	17.4	31.88	2	19.4
19	19	45	8.06	8.687	21	46	34.4	22.85	13	55.4	16	19	41	52.37	13.525	21	53	7.5	33.04	2	4.5
23	19	44	32.48	9.093	21	48	7.5	23.64	13	39.1	20	19	42	47.20	13.881	21	50	53.1	34.11	1	49.7
27	19	43	55.39	9.443	21	49	43.5	24.26	13	22.8	24	19	43	43.37	14.194	21	48	34.6	35.09	1	34.9
July 1	19	43	17.01	-9.737	-21	51	21.6	-24.71	13	6.4	28	19	44	40.69	+14.458	-21	46	12.4	+35.96	1	20.2
5	19	42	37.58	-9.967	-21	53	1.2	-25.01	12	50.0	32	19	45	38.97	+14.671	-21	43	46.9	+36.74	1	5.4

Least semidiameter,  
Greatest semidiameter,

January 12, 1".63  
July 15, 1".80

Least horizontal parallax,  
Greatest horizontal parallax,

January 12, 0".43  
July 15, 0".37

## GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.		Var. of R. A. for 1 Day.		Apparent Declination.		Var. of Decl. for 1 Day.		Meridian Passage.	Month and Day.	Apparent Right Ascension.		Var. of R. A. for 1 Day.		Apparent Declination.		Var. of Decl. for 1 Day.		Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m						h m s	s	° ' "	"	h m				
Jan. 2	7 18 10.85	-7.161	+21 30 51.1	+13.86	12 31.1					July 1	7 20 26.53	+9.389	+21 31 9.7	-17.23	0 45.7				
6	7 17 42.05	7.221	21 31 46.8	14.03	12 14.9					5	7 21 4.24	9.459	21 30 0.0	17.60	0 30.6				
10	7 17 13.12	7.234	21 32 43.1	14.10	11 58.7					9	7 21 42.15	9.494	21 28 48.9	17.91	0 15.5				
14	7 16 44.25	7.196	21 33 39.5	14.07	11 42.5					13	7 22 20.14	9.495	21 27 36.7	18.14	0 0.4				
18	7 16 15.63	7.108	21 34 35.6	13.94	11 26.3					17	7 22 58.07	9.464	21 26 23.8	18.30	23 41.5				
22	7 15 47.46	-6.973	+21 35 30.9	+13.71	11 10.1					21	7 23 35.81	+9.404	+21 25 10.4	-18.40	23 26.4				
26	7 15 19.90	6.797	21 36 25.2	13.41	10 53.9					25	7 24 13.26	9.317	21 23 56.7	18.42	23 11.3				
30	7 14 53.14	6.576	21 37 18.1	13.04	10 37.7					29	7 24 50.30	9.197	21 22 43.1	18.38	22 56.2				
Feb. 3	7 14 27.35	6.312	21 38 9.4	12.60	10 21.6					Aug. 2	7 25 26.79	9.043	21 21 29.7	18.28	22 41.0				
7	7 14 2.70	6.008	21 38 58.8	12.10	10 5.4					6	7 26 2.60	8.857	21 20 16.8	18.11	22 25.9				
11	7 13 39.35	-5.664	+21 39 46.1	+11.52	9 49.3					10	7 26 37.60	+8.637	+21 19 4.8	-17.85	22 10.7				
15	7 13 17.45	5.281	21 40 31.0	10.89	9 33.2					14	7 27 11.66	8.390	21 17 54.0	17.52	21 55.6				
19	7 12 57.15	4.865	21 41 13.2	10.19	9 17.2					18	7 27 44.68	8.115	21 16 44.6	17.12	21 40.4				
23	7 12 38.57	4.422	21 41 52.5	9.45	9 1.2					22	7 28 16.54	7.810	21 15 37.0	16.65	21 25.2				
27	7 12 21.81	3.953	21 42 28.8	8.66	8 45.2					26	7 28 47.13	7.479	21 14 31.4	16.11	21 10.0				
Mar. 3	7 12 6.98	-3.459	+21 43 1.8	+7.82	8 29.2					30	7 29 16.34	+7.121	+21 13 28.1	-15.50	20 54.8				
7	7 11 54.17	2.942	21 43 31.4	6.95	8 13.3					Sept. 3	7 29 44.06	6.736	21 12 27.4	14.81	20 39.5				
11	7 11 43.47	2.405	21 43 57.5	6.07	7 57.3					7	7 30 10.19	6.324	21 11 29.6	14.05	20 24.2				
15	7 11 34.95	1.853	21 44 20.0	5.16	7 41.5					11	7 30 34.62	5.889	21 10 35.0	13.21	20 8.8				
19	7 11 28.66	1.290	21 44 38.8	4.22	7 25.6					15	7 30 57.27	5.431	21 9 43.9	12.31	19 53.5				
23	7 11 24.64	-0.721	+21 44 53.8	+3.26	7 9.9					19	7 31 18.04	+4.953	+21 8 56.5	-11.35	19 38.1				
27	7 11 22.90	-0.148	21 45 4.9	2.27	6 54.1					23	7 31 36.87	4.458	21 8 13.1	10.36	19 22.7				
31	7 11 23.46	+0.428	21 45 12.0	1.28	6 38.4					27	7 31 53.68	3.943	21 7 33.7	9.33	19 7.2				
Apr. 4	7 11 26.33	1.005	21 45 15.1	+0.29	6 22.7					Oct. 1	7 32 8.39	3.411	21 6 58.5	8.22	18 51.7				
8	7 11 31.50	1.581	21 45 14.3	-0.70	6 7.1					5	7 32 20.95	2.864	21 6 27.9	7.04	18 36.2				
12	7 11 38.97	+2.154	+21 45 9.5	-1.70	5 51.4					9	7 32 31.29	+2.306	+21 6 2.2	-5.81	18 20.6				
16	7 11 48.70	2.714	21 45 0.7	2.69	5 35.8					13	7 32 39.39	1.742	21 5 41.5	4.55	18 5.0				
20	7 12 0.65	3.261	21 44 48.0	3.68	5 20.3					17	7 32 45.22	1.172	21 5 25.8	3.28	17 49.4				
24	7 12 14.76	3.794	21 44 31.3	4.66	5 4.8					21	7 32 48.76	0.598	21 5 15.2	2.01	17 33.7				
28	7 12 30.98	4.313	21 44 10.7	5.61	4 49.4					25	7 32 50.00	+0.021	21 5 9.7	-0.73	17 18.0				
May 2	7 12 49.24	+4.816	+21 43 46.3	-6.55	4 34.0					29	7 32 48.93	-0.557	+21 5 9.4	+0.54	17 2.3				
6	7 13 9.48	5.301	21 43 18.2	7.49	4 18.6					Nov. 2	7 32 45.55	1.130	21 5 14.2	1.82	16 46.5				
10	7 13 31.62	5.766	21 42 46.4	8.41	4 3.2					6	7 32 39.90	1.693	21 5 24.1	3.10	16 30.6				
14	7 13 55.58	6.209	21 42 11.0	9.31	3 47.9					10	7 32 32.02	2.244	21 5 39.0	4.36	16 14.8				
18	7 14 21.26	6.625	21 41 32.0	10.17	3 32.6					14	7 32 21.97	2.780	21 5 58.9	5.59	15 58.9				
22	7 14 48.55	+7.015	+21 40 49.6	-11.01	3 17.4					18	7 32 9.81	-3.301	+21 6 23.7	+6.77	15 42.9				
26	7 15 17.35	7.382	21 40 3.9	11.82	3 2.1					22	7 31 55.59	3.804	21 6 53.1	7.90	15 26.9				
30	7 15 47.57	7.723	21 39 15.0	12.59	2 46.9					26	7 31 39.41	4.282	21 7 26.9	9.00	15 10.9				
June 3	7 16 19.10	8.037	21 38 23.2	13.33	2 31.7					30	7 31 21.37	4.734	21 8 5.0	10.04	14 54.9				
7	7 16 51.83	8.322	21 37 28.5	14.03	2 16.5					Dec. 4	7 31 1.58	5.155	21 8 47.1	11.00	14 38.9				
11	7 17 25.64	+8.576	+21 36 31.0	-14.69	2 1.3					8	7 30 40.18	-5.541	+21 9 32.9	+11.88	14 22.8				
15	7 18 0.40	8.798	21 35 31.0	15.29	1 46.2					12	7 30 17.30	5.891	21 10 22.0	12.67	14 6.7				
19	7 18 35.99	8.990	21 34 28.7	15.84	1 31.0					16	7 29 53.10	6.205	21 11 14.1	13.38	13 50.5				
23	7 19 12.28	9.152	21 33 24.3	16.36	1 15.9					20	7 29 27.71	6.482	21 12 8.9	13.99	13 34.4				
27	7 19 49.17	9.286	21 32 17.9	16.82	1 0.8					24	7 29 1.30	6.717	21 13 5.9	14.51	13 18.2				
July 1	7 20 26.53	+9.389	+21 31 9.7	-17.23	0 45.7					28	7 28 34.03	-6.910	+21 14 4.9	+14.95	13 2.0				
5	7 21 4.24	+9.459	+21 30 0.0	-17.60	0 30.6					32	7 28 6.09	-7.053	+21 15 5.4	+15.28	12 45.8				

Greatest semidiameter,  
Least semidiameter,

January 9, 1".33  
July 12, 1".25

Greatest horizontal parallax,  
Least horizontal parallax,

January 9, 0".30  
July 12, 0".28

MERCURY.										
GREENWICH MEAN NOON.										
Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"	°	'	"	°	'	At Date.	At Intermediate Date.
Jan. 0	340	2	27.0	4 11 51.2	— 9 9.9	— 6 27 42.5	+ 11 49.5	9.578 7639	0.083 8878	0.080 4678
1	344	18	6.1	4 19 30.6	10 24.0	6 14 38.9	14 19.2	9.572 0764	0.076 9404	0.073 3027
2	348	41	35.2	4 27 31.0	11 26.1	5 59 1.5	16 56.9	9.565 2673	0.069 5523	0.065 6864
3	353	13	14.5	4 35 50.8	12 13.3	5 40 42.6	19 42.1	9.558 3731	0.061 7025	0.057 5982
4	357	53	22.4	4 44 27.7	12 42.9	5 19 35.3	22 33.4	9.551 4369	0.053 3711	0.049 0190
5	2	42	14.6	4 53 19.0	— 12 52.2	— 4 55 34.4	+ 25 29.0	9.544 5084	0.044 5395	0.039 9308
6	7	40	3.7	5 2 20.8	12 39.1	4 28 36.7	28 26.6	9.537 6444	0.035 1913	0.030 3197
7	12	46	57.9	5 11 28.2	12 1.8	3 58 41.6	31 23.2	9.530 9092	0.025 3147	0.020 1757
8	18	3	0.0	5 20 35.4	10 59.3	3 25 52.0	24 14.9	9.524 3743	0.014 9027	0.009 4960
9	23	28	6.2	5 29 35.1	9 31.7	2 50 14.9	36 57.2	9.518 1172	0.003 9568	9.998 2867
10	29	2	5.2	5 38 19.6	— 7 40.3	— 2 12 2.4	+ 39 24.9	9.512 2213	9.992 4883	9.986 5646
11	34	44	37.2	5 46 39.4	5 28.0	1 31 31.8	41 32.4	9.506 7734	9.980 5201	9.974 3604
12	40	35	12.4	5 54 24.4	2 59.1	0 49 6.3	43 13.8	9.501 8614	9.968 0922	9.961 7230
13	46	33	11.0	6 1 24.4	— 0 19.3	— 0 5 14.8	44 23.4	9.497 5714	9.955 2625	9.948 7214
14	52	37	42.5	6 7 28.4	+ 2 24.3	+ 0 39 28.2	44 56.1	9.493 9840	9.942 1122	9.935 4488
15	58	47	45.8	6 12 26.2	+ 5 3.6	+ 1 24 23.9	+ 44 48.0	9.491 1713	9.928 7472	9.922 0245
16	65	2	10.1	6 16 8.9	7 30.3	2 8 49.8	43 56.3	9.489 1926	9.915 3004	9.908 5960
17	71	19	36.2	6 18 28.7	9 36.5	2 52 1.9	42 20.6	9.488 0909	9.901 9341	9.895 3388
18	77	38	38.3	6 19 20.3	11 15.1	3 33 17.0	40 2.6	9.487 8909	9.888 8362	9.882 4536
19	83	57	46.6	6 18 40.9	12 20.9	4 11 54.3	37 5.8	9.488 5970	9.876 2195	9.870 1630
20	90	15	30.2	6 16 31.0	+ 12 50.6	+ 4 47 17.6	+ 33 35.6	9.490 1934	9.864 3139	9.858 7016
21	96	30	19.7	6 12 53.8	12 43.4	5 18 56.8	29 38.9	9.492 6449	9.853 3561	9.848 3055
22	102	40	50.8	6 7 55.4	12 0.8	5 46 29.3	25 23.6	9.495 8990	9.843 5775	9.839 1985
23	108	45	46.2	6 1 44.1	10 46.4	6 9 40.5	20 57.6	9.499 8889	9.835 1913	9.831 5764
24	114	43	58.1	5 54 30.0	9 5.3	6 28 23.5	16 28.5	9.504 5372	9.828 3719	9.825 5931
25	120	34	29.2	5 46 24.5	+ 7 3.6	+ 6 42 38.8	+ 12 3.3	9.509 7597	9.823 2501	9.821 3503
26	126	16	33.8	5 37 39.1	4 48.1	6 52 33.2	7 47.6	9.515 4689	9.819 8965	9.818 8883
27	131	49	37.8	5 28 25.2	2 25.2	6 58 18.7	3 46.1	9.521 5772	9.818 3208	9.818 1858
28	137	13	18.2	5 18 53.5	+ 0 1.2	7 0 11.1	+ 0 1.8	9.527 9996	9.818 4715	9.819 1634
29	142	27	22.1	5 9 13.6	— 2 18.7	6 58 28.7	— 3 23.1	9.534 6558	9.820 2449	9.821 6970
30	147	31	45.5	4 59 34.0	— 4 29.9	+ 6 53 31.5	— 6 27.7	9.541 4715	9.823 4983	9.825 6266
31	152	26	32.5	4 50 1.7	6 29.0	6 45 40.0	9 11.9	9.548 3792	9.828 0588	9.830 7712
Feb. 1	157	11	53.2	4 40 42.5	8 13.6	6 35 14.4	11 36.0	9.555 3187	9.833 7403	9.836 9426
2	161	48	3.1	4 31 40.6	9 42.0	6 22 34.3	13 41.2	9.562 2370	9.840 3548	9.843 9544
3	166	15	21.4	4 22 59.6	10 53.5	6 7 57.9	15 28.7	9.569 0884	9.847 7202	9.851 6310
4	170	34	10.1	4 14 41.8	— 11 47.7	+ 5 51 42.2	— 17 0.0	9.575 8338	9.855 6675	9.859 8117
5	174	44	53.2	4 6 48.7	12 25.1	5 34 2.8	18 16.5	9.582 4396	9.864 0469	9.868 3568
6	178	47	55.9	3 59 21.2	12 46.3	5 15 13.6	19 19.9	9.588 8779	9.872 7265	9.877 1429
7	182	43	44.1	3 52 19.5	12 52.2	4 55 27.0	20 11.5	9.595 1257	9.881 5937	9.886 0677
8	186	32	43.7	3 45 43.8	12 44.1	4 34 54.0	20 52.8	9.601 1641	9.890 5546	9.895 0455
9	190	15	20.2	3 39 33.5	— 12 23.2	+ 4 13 44.3	— 21 25.1	9.606 9780	9.899 5321	9.904 0071
10	193	51	58.9	3 33 48.1	11 50.9	3 52 6.3	21 49.6	9.612 5551	9.908 4639	9.912 8966
11	197	23	4.3	3 28 26.7	11 8.5	3 30 7.4	22 7.1	9.617 8858	9.917 3005	9.921 6712
12	200	49	0.0	3 23 28.5	10 17.4	3 7 54.1	22 18.7	9.622 9629	9.926 0044	9.930 2963
13	204	10	8.7	3 18 52.6	9 18.8	2 45 31.8	22 25.2	9.627 7808	9.934 5443	9.938 7464
14	207	26	52.3	3 14 38.0	— 8 14.1	+ 2 23 5.3	— 22 27.2	9.632 3356	9.942 9003	9.947 0041
15	210	39	31.6	3 10 43.9	— 7 4.4	+ 2 0 38.7	— 22 25.5	9.636 6247	9.951 0562	9.955 0557

## MERCURY.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Interme- diate Date.
Feb. 15	210 39 31.6	3 10 43.9	- 7 4.4	+ 2 0 38.7	- 22 25.5	9.636 6247	9.951 0562	9.955 0557
16	213 48 26.6	3 7 9.3	5 50.8	1 38 15.5	22 20.4	9.640 6462	9.959 0017	9.962 8931
17	216 53 56.4	3 3 53.2	4 34.4	1 15 58.8	22 12.5	9.644 3992	9.966 7296	9.970 5110
18	219 56 19.1	3 0 54.9	3 16.1	0 53 51.2	22 2.2	9.647 8834	9.974 2372	9.977 9079
19	222 55 52.1	2 58 19.7	1 56.9	0 31 55.1	21 49.7	9.651 0990	9.981 5232	9.985 0831
20	225 52 52.0	2 55 48.8	- 0 37.5	+ 0 10 12.4	- 21 35.4	9.654 0464	9.988 5881	9.992 0385
21	228 47 34.8	2 53 39.4	+ 0 41.3	- 0 11 15.1	21 19.5	9.656 7263	9.995 4347	9.998 7772
22	231 40 15.8	2 51 45.0	1 58.7	0 32 25.9	21 2.0	9.659 1397	0.002 0664	0.005 3028
23	234 31 9.7	2 50 5.1	3 14.1	0 53 18.7	20 43.3	9.661 2875	0.008 4870	0.011 6197
24	237 20 30.8	2 48 39.3	4 27.0	1 13 52.1	20 23.3	9.663 1709	0.014 7018	0.017 7337
25	240 8 32.8	2 47 27.0	+ 5 36.7	- 1 34 4.9	- 20 2.2	9.664 7907	0.020 7160	0.023 6493
26	242 55 29.1	2 46 27.8	6 42.7	1 53 56.1	19 40.1	9.666 1478	0.026 5343	0.029 3718
27	245 41 32.8	2 45 41.6	7 44.6	2 13 24.7	19 16.9	9.667 2431	0.032 1625	0.034 9072
28	248 26 56.6	2 45 8.1	8 41.9	2 32 29.5	18 52.6	9.668 0771	0.037 6063	0.040 2605
Mar. 1	251 11 53.2	2 44 47.1	9 34.1	2 51 9.6	18 27.3	9.668 6505	0.042 8705	0.045 4368
2	253 56 34.9	2 44 38.3	+ 10 21.0	- 3 9 23.8	- 18 1.0	9.668 9636	0.047 9602	0.050 4415
3	256 41 13.9	2 44 41.8	11 2.2	3 27 11.1	17 33.5	9.669 0168	0.052 8812	0.055 2797
4	259 26 2.5	2 44 55.5	11 37.2	3 44 30.4	17 4.8	9.668 8100	0.057 6376	0.059 9555
5	262 11 12.9	2 45 25.4	12 5.9	4 1 20.2	16 34.7	9.668 3431	0.062 2339	0.064 4733
6	264 56 57.3	2 46 5.6	12 27.9	4 17 39.3	16 3.4	9.667 6158	0.066 6741	0.068 8371
7	267 43 28.2	2 46 58.2	+ 12 43.1	- 4 33 26.4	- 15 30.5	9.666 6277	0.070 9624	0.073 0505
8	270 30 57.9	2 48 3.3	12 51.1	4 48 39.7	14 55.8	9.665 3779	0.075 1016	0.077 1163
9	273 19 39.0	2 49 21.2	12 51.7	5 3 17.5	14 19.4	9.663 8657	0.079 0948	0.081 0377
10	276 9 44.6	2 50 52.2	12 44.8	5 17 17.8	13 40.9	9.662 0903	0.082 9450	0.084 8171
11	279 1 27.8	2 52 36.5	12 30.3	5 30 38.6	13 0.2	9.660 0509	0.086 6542	0.088 4564
12	281 55 2.2	2 54 34.6	+ 12 8.0	- 5 43 17.4	- 12 17.0	9.657 7463	0.090 2241	0.091 9573
13	284 50 41.6	2 56 46.8	11 37.9	5 55 11.7	11 31.1	9.655 1756	0.093 6561	0.095 3207
14	287 48 40.6	2 59 13.7	11 0.1	6 6 18.6	10 42.2	9.652 3378	0.096 9509	0.098 5472
15	290 49 14.0	3 1 55.6	10 14.5	6 16 35.0	9 50.0	9.649 2322	0.100 1091	0.101 6366
16	293 52 37.1	3 4 53.3	9 21.3	6 25 57.4	8 54.2	9.645 8580	0.103 1297	0.104 5884
17	296 59 6.0	3 8 7.3	+ 8 20.8	- 6 34 22.1	- 7 54.3	9.642 2150	0.106 0125	0.107 4018
18	300 8 57.3	3 11 38.2	7 13.1	6 41 44.7	6 50.1	9.638 3034	0.108 7558	0.110 0740
19	303 22 28.2	3 15 26.7	5 58.8	6 48 0.6	5 41.1	9.634 1237	0.111 3563	0.112 6026
20	306 39 56.7	3 19 33.5	4 38.3	6 53 4.9	4 26.8	9.629 6773	0.113 8122	0.114 9847
21	310 1 41.6	3 23 59.4	3 12.3	6 56 52.1	3 6.7	9.624 9667	0.116 1194	0.117 2155
22	313 28 2.1	3 28 45.0	+ 1 41.7	- 6 59 16.2	- 1 40.4	9.619 9952	0.118 2724	0.119 2895
23	316 59 18.3	3 33 51.0	+ 0 7.5	7 0 10.8	- 0 7.5	9.614 7676	0.120 2661	0.121 2011
24	320 35 51.0	3 39 18.1	- 1 29.2	6 59 28.9	+ 1 32.5	9.609 2903	0.122 0935	0.122 9423
25	324 18 1.6	3 45 6.9	3 7.0	6 57 3.2	3 20.2	9.603 5720	0.123 7464	0.124 5048
26	328 6 12.1	3 51 17.7	4 44.2	6 52 45.8	5 15.9	9.597 6238	0.125 2162	0.125 8793
27	332 0 44.7	3 57 51.1	- 6 18.9	- 6 46 28.6	+ 7 20.0	9.591 4597	0.126 4926	0.127 0547
28	336 2 1.8	4 4 47.0	7 49.1	6 38 3.0	9 32.7	9.585 0968	0.127 5640	0.128 0188
29	340 10 26.0	4 12 5.3	9 12.3	6 27 20.4	11 54.0	9.578 5564	0.128 4174	0.128 7579
30	344 26 19.5	4 19 45.4	10 26.0	6 14 12.1	14 23.9	9.571 8646	0.129 0385	0.129 2573
31	348 50 3.7	4 27 46.3	11 27.7	5 58 29.8	17 1.9	9.565 0522	0.129 4119	0.129 5001
Apr. 1	353 21 58.6	4 36 6.7	- 12 14.5	- 5 40 5.8	+ 19 47.3	9.558 1560	0.129 5196	0.129 4684
2	358 2 22.7	4 44 44.2	- 12 43.5	- 5 18 53.2	+ 22 38.7	9.551 2191	0.129 3438	0.129 1431

MERCURY.									
GREENWICH MEAN NOON.									
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Interme- diate Date.	
Apr.	1 353 21 58.6	4 36 6.7	- 12 14.5	- 5 40 5.8	+ 19 47.3	9.558 1560	0.129 5196	0.129 4684	
	2 358 2 22.7	4 44 44.2	12 43.5	5 18 53.2	22 38.7	9.551 2191	0.129 3438	0.129 1431	
	3 2 51 31.7	4 53 35.9	12 52.2	4 54 46.9	25 34.5	9.544 2915	0.128 8636	0.128 5028	
	4 7 49 37.9	5 2 38.0	12 38.3	4 27 43.6	28 32.2	9.537 4303	0.128 0579	0.127 5262	
	5 12 56 49.3	5 11 45.6	12 0.2	3 57 43.0	31 28.7	9.530 7002	0.126 9046	0.126 1902	
	6 18 13 8.6	5 20 52.6	- 10 57.0	- 3 24 48.0	+ 34 20.2	9.524 1727	0.125 3800	0.124 4713	
	7 23 38 31.7	5 29 52.0	9 28.6	2 49 5.9	37 2.1	9.517 9257	0.123 4609	0.122 3459	
	8 29 12 47.2	5 38 35.7	7 36.5	2 10 48.9	39 29.2	9.512 0425	0.121 1235	0.119 7907	
	9 34 55 34.8	5 46 54.6	5 23.6	1 30 14.4	41 36.0	9.506 6100	0.118 3450	0.116 7837	
	10 40 46 24.6	5 54 38.4	2 54.2	0 47 45.6	43 16.6	9.501 7163	0.115 1044	0.113 3045	
	11 46 44 36.4	6 1 36.8	- 0 14.2	- 0 3 51.8	+ 44 25.1	9.497 4472	0.111 3818	0.109 3345	
	12 52 49 19.4	6 7 38.9	+ 2 29.3	+ 0 40 52.3	44 56.5	9.493 8832	0.107 1609	0.104 8594	
	13 58 59 32.1	6 12 34.6	5 8.4	1 25 47.6	44 47.0	9.491 0959	0.102 4288	0.099 8682	
	14 65 14 3.4	6 16 14.8	7 34.6	2 10 11.8	43 54.0	9.489 1441	0.097 1768	0.094 3544	
	15 71 31 33.9	6 18 31.8	9 40.0	2 53 21.0	42 17.0	9.488 0704	0.091 4010	0.088 3170	
	16 77 50 37.6	6 19 20.6	+ 11 17.7	+ 3 34 31.8	+ 39 57.7	9.487 8989	0.085 1032	0.081 7604	
	17 84 9 44.7	6 18 38.3	12 22.4	4 13 3.6	36 59.7	9.488 6333	0.078 2898	0.074 6932	
	18 90 27 24.1	6 16 25.4	12 50.9	4 48 20.3	33 28.6	9.490 2572	0.070 9724	0.067 1299	
	19 96 42 6.8	6 12 45.7	12 42.6	5 19 52.1	29 31.3	9.492 7348	0.063 1684	0.059 0904	
	20 102 52 28.5	6 7 44.8	11 59.0	5 47 16.7	25 15.5	9.496 0130	0.054 8990	0.050 5974	
	21 108 57 12.3	6 1 31.3	+ 10 43.6	+ 6 10 19.6	+ 20 49.2	9.500 0247	0.046 1890	0.041 6772	
	22 114 55 10.5	5 54 15.5	9 1.7	6 28 54.2	16 20.1	9.504 6924	0.037 0659	0.032 3590	
	23 120 45 26.4	5 46 8.6	6 59.5	6 43 1.2	11 55.2	9.509 9316	0.027 5606	0.022 6747	
	24 126 27 14.6	5 37 22.1	4 43.7	6 52 47.7	7 39.9	9.515 6547	0.017 7053	0.012 6563	
	25 132 0 1.2	5 28 7.5	+ 2 20.7	6 58 25.6	+ 3 38.8	9.521 7741	0.007 5321	0.002 3370	
	26 137 23 23.6	5 18 35.4	- 0 3.3	+ 7 0 11.0	- 0 4.9	9.528 2050	9.997 0751	9.991 7506	
	27 142 37 9.2	5 8 55.4	2 22.9	6 58 22.3	3 29.2	9.534 8673	9.986 3678	9.980 9308	
	28 147 41 14.5	4 59 15.9	4 33.8	6 53 19.4	6 33.1	9.541 6869	9.975 4439	9.969 9112	
	29 152 35 43.5	4 49 44.0	6 32.5	6 45 22.8	9 16.6	9.548 5964	9.964 3370	9.958 7255	
	30 157 20 46.7	4 40 25.2	8 16.6	6 34 52.7	11 40.2	9.555 5359	9.953 0808	9.947 4071	
May	1 161 56 39.6	4 31 24.0	- 9 44.5	+ 6 22 8.7	- 13 44.8	9.562 4530	9.941 7085	9.935 9893	
	2 166 23 41.6	4 22 43.6	10 55.5	6 7 29.0	15 31.8	9.569 3018	9.930 2538	9.924 5062	
	3 170 42 14.7	4 14 26.6	11 49.2	5 51 10.6	17 2.6	9.576 0432	9.918 7511	9.912 9925	
	4 174 52 43.0	4 6 34.3	12 26.0	5 33 28.8	18 18.7	9.582 6441	9.907 2350	9.901 4831	
	5 178 55 31.8	3 59 7.6	12 46.7	5 14 37.6	19 21.7	9.589 0767	9.895 7415	9.890 0148	
	6 182 51 6.8	3 52 6.8	- 12 52.2	+ 4 54 49.4	- 20 13.0	9.595 3182	9.884 3077	9.878 6251	
	7 186 39 54.0	3 45 31.9	12 43.7	4 34 15.1	20 54.0	9.601 3500	9.872 9719	9.867 3535	
	8 190 22 19.0	3 39 22.3	12 22.4	4 13 4.4	21 26.0	9.607 1566	9.861 7753	9.856 2425	
	9 193 58 46.9	3 33 37.6	11 49.7	3 51 25.7	21 50.2	9.612 7260	9.850 7605	9.845 3351	
	10 197 29 42.3	3 28 17.0	11 7.0	3 29 26.3	22 7.5	9.618 0488	9.839 9723	9.834 6781	
	11 200 55 28.7	3 23 19.5	- 10 15.6	+ 3 7 12.6	- 22 18.9	9.623 1177	9.829 4585	9.824 3198	
	12 204 16 28.8	3 18 44.3	9 16.9	2 44 50.1	22 25.3	9.627 9273	9.819 2685	9.814 3112	
	13 207 33 4.4	3 14 30.4	8 12.0	2 22 23.5	22 27.2	9.632 4738	9.809 4545	9.804 7052	
	14 210 45 36.4	3 10 36.9	7 2.1	1 59 56.9	22 25.3	9.636 7544	9.800 0702	9.795 5564	
	15 213 54 24.8	3 7 2.9	5 48.4	1 37 33.9	22 20.2	9.640 7675	9.791 1709	9.786 9208	
	16 216 59 48.5	3 3 47.4	- 4 32.0	+ 1 15 17.5	- 22 12.2	9.644 5121	9.782 8133	9.778 8551	
	17 220 2 5.6	3 0 49.7	- 3 13.7	+ 0 53 10.3	- 22 1.8	9.647 9881	9.775 0529	9.771 4134	

## MERCURY.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
	°	'	"			'	"	°			'	"	At Date.
May	17	220	2	5.6	3 0 49.7	— 3	13.7	+ 0	53 10.3	— 22 1.8	9.647 9881	9.775 0529	9.771 4134
	18	223	1	33.6	2 58 9.0	1	54.4	0	31 14.6	21 49.3	9.651 1955	9.767 9437	9.764 6507
	19	225	58	29.0	2 55 44.5	— 0	35.0	+ 0	9 32.3	21 34.9	9.654 1345	9.761 5405	9.758 6189
	20	228	53	7.7	2 53 35.6	+ 0	43.7	— 0	11 54.7	21 18.9	9.656 8059	9.755 8914	9.753 3634
	21	231	45	45.1	2 51 41.7	2	1.1	0	33 5.0	21 1.5	9.659 2108	9.751 0403	9.748 9268
	22	234	36	36.0	2 50 2.3	+ 3	16.4	— 0	53 57.2	— 20 42.7	9.661 3504	9.747 0265	9.745 3430
	23	237	25	54.5	2 48 36.8	4	29.1	1	14 29.9	20 22.7	9.663 2256	9.743 8798	9.742 6397
	24	240	13	54.2	2 47 24.9	5	38.8	1	34 42.1	20 1.5	9.664 8372	9.741 6245	9.740 8357
	25	243	0	48.6	2 46 26.2	6	44.7	1	54 32.6	19 39.3	9.666 1860	9.740 2740	9.739 9397
	26	245	46	50.9	2 45 40.4	7	46.4	2	14 0.5	19 16.1	9.667 2731	9.739 8326	9.739 9517
	27	248	32	13.8	2 45 7.3	+ 8	43.5	— 2	33 4.6	— 18 51.9	9.668 0991	9.740 2955	9.740 8617
June	1	262	16	30.5	2 45 26.4	+ 12	6.7	— 4	1 51.0	— 16 33.8	9.668 3250	9.755 3715	9.757 9401
	2	265	2	16.1	2 46 7.0	12	28.5	4	18 9.2	16 2.4	9.667 5896	9.760 6784	9.763 5804
	3	267	48	48.6	2 47 0.0	12	43.4	4	33 55.2	15 29.4	9.666 5933	9.766 6393	9.769 8484
	4	270	36	20.3	2 48 5.5	12	51.1	4	49 7.4	14 54.7	9.665 3354	9.773 2010	9.776 6907
	5	273	25	3.9	2 49 23.8	12	51.5	5	3 44.1	14 18.2	9.663 8152	9.780 3106	9.784 0539
	6	276	15	12.2	2 50 55.2	+ 12	44.4	— 5	17 43.2	— 13 39.7	9.662 0318	9.787 9145	9.791 8861
	7	279	6	58.6	2 52 39.9	12	29.7	5	31 2.7	12 58.9	9.659 9842	9.795 9623	9.800 1368
	8	282	0	36.7	2 54 38.4	12	7.2	5	43 40.2	12 15.6	9.657 6714	9.804 4038	9.808 7575
	9	284	56	20.2	2 56 51.1	11	36.9	5	55 33.1	11 29.6	9.655 0925	9.813 1921	9.817 7019
	10	287	54	23.7	2 59 18.4	10	58.8	6	6 38.5	10 40.7	9.652 2465	9.822 2820	9.826 9273
	11	290	55	2.1	3 2 0.8	+ 10	13.0	— 6	16 53.3	— 9 48.4	9.649 1327	9.831 6329	9.836 3938
July	1	293	58	30.7	3 4 59.0	9	19.6	6	26 14.0	8 52.4	9.645 7502	9.841 2052	9.846 0630
	2	297	5	5.6	3 8 13.5	8	28.8	6	34 36.7	7 52.4	9.642 0988	9.850 9632	9.855 9014
	3	300	15	3.4	3 11 44.9	7	10.9	6	41 57.3	6 48.0	9.638 1788	9.860 8738	9.865 8766
	4	303	28	41.4	3 15 34.0	5	56.4	6	48 11.1	5 38.8	9.633 9910	9.870 9061	9.875 9590
	5	306	46	17.6	3 19 41.4	+ 4	35.7	— 6	53 13.1	— 4 24.3	9.629 5365	9.881 0319	9.886 1214
	6	310	8	10.6	3 24 7.9	3	9.6	6	56 57.8	3 4.1	9.624 8176	9.891 2243	9.896 3380
	7	313	34	39.9	3 28 54.1	1	38.9	6	59 19.2	1 37.7	9.619 8379	9.901 4596	9.906 5862
	8	317	6	5.6	3 34 0.8	+ 0	4.5	7	0 10.9	— 0 4.6	9.614 6025	9.911 7151	9.916 8434
	9	320	42	48.4	3 39 28.5	— 1	32.3	6	59 26.0	+ 1 35.7	9.609 1178	9.921 9686	9.927 0884
	10	324	25	9.8	3 45 17.9	— 3	10.1	— 6	56 57.0	3 23.6	9.603 3924	9.932 2004	9.937 3019
	11	328	13	31.6	3 51 29.5	4	47.2	6	52 36.1	5 19.6	9.597 4373	9.942 3904	9.947 4636
August	1	332	8	16.3	3 58 3.6	6	21.8	6	46 15.0	7 23.9	9.591 2668	9.952 5192	9.957 5551
	2	336	9	46.3	4 5 0.2	7	51.8	6	37 45.3	9 36.9	9.584 8982	9.962 5688	9.967 5577
	3	340	18	24.1	4 12 19.1	9	14.8	6	26 58.3	11 58.5	9.578 3529	9.972 5195	9.977 4517
	4	344	34	31.8	4 19 59.9	— 10	28.2	— 6	13 45.4	+ 14 28.7	9.571 6569	9.982 3520	9.987 2180
	5	348	58	30.7	4 28 1.5	11	29.4	5	57 58.2	17 7.0	9.564 8414	9.992 0470	9.996 8364
	6	353	30	41.1	4 36 22.4	12	15.6	5	39 29.0	19 52.5	9.557 9432	0.001 5837	0.006 2862
	7	358	11	21.1	4 45 0.4	12	44.0	5	18 11.1	22 44.1	9.551 0059	0.010 9411	0.015 5456
	8	3	0	46.5	4 53 52.5	12	52.1	4	53 59.4	25 40.0	9.544 0795	0.020 0970	0.024 5923
	9	7	59	9.4	5 2 54.7	— 12	37.6	— 4	26 50.7	+ 28 37.7	9.537 2215	0.029 0283	0.033 4020
	10	13	6	37.7	5 12 2.3	— 11	58.7	— 3	56 44.6	+ 31 34.1	9.530 4966	0.037 7103	0.041 9502

MERCURY.													
GREENWICH MEAN NOON.													
Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
	°	'	"			°	'	"			At Date.	At Intermediate Date.	
July	1	7	59 9.4	5 2 54.7	— 12 37.6	— 4 26 50.7	+ 28 37.7	9.537 2215	0.029 0283	0.033 4020			
	2	13	6 37.7	5 12 2.3	11 58.7	3 56 44.6	31 34.1	9.530 4966	0.037 7103	0.041 9502			
	3	18	23 13.7	5 21 9.2	10 54.6	3 23 44.3	34 25.3	9.523 9766	0.046 1183	0.050 2114			
	4	23	48 53.4	5 30 8.3	9 25.4	2 47 57.2	37 6.8	9.517 7397	0.054 2262	0.058 1594			
	5	29	23 25.0	5 38 51.5	7 32.7	2 9 35.6	39 33.5	9.511 8693	0.062 0077	0.065 7677			
	6	35	6 27.9	5 47 9.4	— 5 19.2	— 1 28 57.1	+ 41 39.5	9.506 4522	0.069 4358	0.073 0089			
	7	40	57 31.9	5 54 51.9	2 49.4	0 46 25.3	43 19.1	9.501 5765	0.076 4840	0.079 8581			
	8	46	55 56.5	6 1 48.6	— 0 9.1	— 0 2 29.5	44 26.6	9.497 3279	0.083 1280	0.086 2908			
	9	53	0 50.4	6 7 48.9	+ 2 34.4	+ 0 42 15.5	44 56.8	9.493 7869	0.089 3439	0.092 2847			
	10	59	11 12.0	6 12 42.4	5 13.1	1 27 10.5	44 46.0	9.491 0247	0.095 1109	0.097 8202			
	11	65	25 50.0	6 16 20.0	+ 7 38.8	+ 2 11 33.0	+ 43 51.7	9.489 0995	0.100 4107	0.102 8808			
	12	71	43 24.5	6 18 34.4	9 43.4	2 54 39.2	42 13.4	9.488 0534	0.105 2292	0.107 4549			
	13	78	2 29.5	6 19 20.3	11 20.2	3 35 45.7	39 52.8	9.487 9097	0.109 5572	0.111 5357			
	14	84	21 35.0	6 18 35.3	12 23.8	4 14 12.0	36 53.7	9.488 6719	0.113 3899	0.115 1198			
	15	90	39 10.1	6 16 19.9	12 51.2	4 49 22.1	33 21.6	9.490 3227	0.116 7260	0.118 2094			
	16	96	53 45.9	6 12 37.4	+ 12 41.8	+ 5 20 46.5	+ 29 23.6	9.492 8259	0.119 5709	0.120 8118			
	17	103	3 58.1	6 7 34.1	11 57.1	5 48 3.2	25 7.4	9.496 1278	0.121 9336	0.122 9380			
	18	109	8 30.2	6 1 18.6	10 40.9	6 10 57.9	20 41.0	9.500 1609	0.123 8271	0.124 6030			
	19	115	6 14.8	5 54 1.1	8 58.3	6 29 24.2	16 11.9	9.504 8473	0.125 2681	0.125 8249			
	20	120	56 15.5	5 45 52.8	6 55.5	6 43 23.1	11 47.1	9.510 1025	0.126 2757	0.126 6232			
	21	126	37 47.3	5 37 5.3	+ 4 39.3	+ 6 53 1.7	+ 7 32.2	9.515 8390	0.126 8704	0.127 0201			
	22	132	10 16.8	5 27 50.0	+ 2 16.2	6 58 32.3	+ 3 31.6	9.521 9691	0.127 0751	0.127 0383			
	23	137	33 21.5	5 18 17.4	— 0 7.7	7 0 10.8	— 0 11.5	9.528 4082	0.126 9125	0.126 7005			
	24	142	46 49.1	5 8 37.4	2 27.1	6 58 15.8	3 35.1	9.535 0763	0.126 4052	0.126 0293			
	25	147	50 36.4	4 58 58.2	4 37.6	6 53 7.3	6 38.5	9.541 8994	0.125 5756	0.125 0467			
	26	152	44 47.9	4 49 26.5	— 6 35.9	+ 6 45 5.6	— 9 21.4	9.548 8106	0.124 4453	0.123 7737			
	27	157	29 34.0	4 40 8.2	8 19.6	6 34 31.1	11 44.3	9.555 7501	0.123 0345	0.122 2301			
	28	162	5 10.2	4 31 7.6	9 47.0	6 21 43.3	13 48.4	9.562 6656	0.121 3627	0.120 4344			
	29	166	31 56.1	4 22 28.0	10 57.3	6 7 0.3	15 34.8	9.569 5116	0.119 4473	0.118 4032			
	30	170	50 13.9	4 14 11.7	11 50.5	5 50 39.1	17 5.1	9.576 2491	0.117 3043	0.116 1525			
	31	175	0 27.7	4 6 20.2	— 12 26.9	+ 5 32 55.0	— 18 20.8	9.582 8452	0.114 9493	0.113 6962			
Aug.	1	179	3 2.7	3 58 54.3	12 47.1	5 14 1.9	19 23.4	9.589 2722	0.112 3946	0.111 0462			
	2	182	58 24.8	3 51 54.3	12 52.1	4 54 12.1	20 14.4	9.595 5073	0.109 6523	0.108 2143			
	3	186	46 59.9	3 45 20.1	12 43.2	4 33 36.6	20 55.1	9.601 5321	0.106 7332	0.105 2103			
	4	190	29 13.5	3 39 11.4	12 21.5	4 12 24.9	21 26.9	9.607 3314	0.103 6465	0.102 0427			
	5	194	5 30.9	3 33 27.4	— 11 48.5	+ 3 50 45.4	— 21 50.9	9.612 8932	0.100 3998	0.098 7188			
	6	197	36 16.4	3 28 7.5	11 5.5	3 28 45.5	22 8.0	9.618 2081	0.097 0005	0.095 2455			
	7	201	1 53.6	3 23 10.8	10 13.9	3 6 31.5	22 19.2	9.623 2692	0.093 4544	0.091 6279			
	8	204	22 45.3	3 18 36.3	9 15.0	2 44 8.8	22 25.4	9.628 0711	0.089 7664	0.087 8703			
	9	207	39 13.1	3 14 23.0	8 9.9	2 21 42.1	22 27.2	9.632 6096	0.085 9402	0.083 9765			
	10	210	51 38.0	3 10 30.1	— 6 59.9	+ 1 59 15.5	— 22 25.2	9.636 8821	0.081 9795	0.079 9495			
	11	214	0 19.8	3 6 56.6	5 46.1	1 36 52.7	22 20.0	9.640 8869	0.077 8868	0.075 7915			
	12	217	5 37.5	3 3 41.7	4 29.5	1 14 36.6	22 12.0	9.644 6233	0.073 6638	0.071 5037			
	13	220	7 49.2	3 0 44.5	3 11.2	0 52 29.7	22 1.4	9.648 0908	0.069 3114	0.067 0871			
	14	223	7 12.2	2 58 4.3	1 52.0	0 30 34.3	21 48.8	9.651 2896	0.064 8306	0.062 5419			
	15	226	4 3.2	2 55 40.3	— 0 32.6	+ 0 8 52.5	— 21 34.4	9.654 2203	0.060 2210	0.057 8679			
	16	228	58 38.1	2 53 31.9	+ 0 46.1	— 0 12 34.0	— 21 18.4	9.656 8837	0.055 4824	0.053 0646			



## MERCURY.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Inter- mediate Date.
Aug. 16	228 58 38.1	2 53 31.9	+ 0 46.1	- 0 12 34.0	- 21 18.4	9.656 8837	0.055 4824	0.053 0646
17	231 51 12.0	2 51 38.4	2 3.4	0 33 43.8	21 0.9	9.659 2807	0.050 6139	0.048 1304
18	234 41 59.8	2 49 59.4	3 18.7	0 54 35.4	20 42.0	9.661 4122	0.045 6137	0.043 0638
19	237 31 15.6	2 48 34.4	4 31.4	1 15 7.5	20 22.0	9.663 2792	0.040 4806	0.037 8638
20	240 19 13.2	2 47 22.9	5 40.9	1 35 19.0	20 0.9	9.664 8826	0.035 2130	0.032 5278
21	243 6 5.9	2 46 24.6	+ 6 46.6	- 1 55 8.9	- 19 38.7	9.666 2234	0.029 8079	0.027 0532
22	245 52 6.8	2 45 39.3	7 48.2	2 14 36.0	19 15.4	9.667 3024	0.024 2633	0.021 4377
23	248 37 28.6	2 45 6.5	8 45.2	2 33 39.3	18 51.1	9.668 1205	0.018 5763	0.015 6785
24	251 22 23.9	2 44 46.2	9 37.2	2 52 17.9	18 25.8	9.668 6779	0.012 7441	0.009 7729
25	254 7 5.1	2 44 38.2	10 23.7	3 10 30.5	17 59.3	9.668 9750	0.006 7645	0.003 7183
26	256 51 44.3	2 44 42.4	+ 11 4.5	- 3 28 16.1	- 17 31.7	9.669 0121	0.000 6340	9.997 5115
27	259 36 33.9	2 44 58.9	11 39.2	3 45 33.6	17 3.0	9.668 7894	9.994 3503	9.991 1502
28	262 21 46.1	2 45 27.5	12 7.5	4 2 21.6	16 32.9	9.668 3065	9.987 9109	9.984 6323
29	265 7 33.0	2 46 8.4	12 29.1	4 18 38.8	16 1.4	9.667 5631	9.981 3141	9.977 9560
30	267 54 7.1	2 47 1.8	12 43.8	4 34 23.8	15 28.4	9.666 5588	9.974 5580	9.971 1201
Sept. 1	270 41 40.8	2 48 7.7	+ 12 51.3	- 4 49 35.0	- 14 53.7	9.665 2928	9.967 6424	9.964 1248
2	273 30 26.8	2 49 26.4	12 51.5	5 4 10.5	14 17.1	9.663 7645	9.960 5675	9.956 9708
3	276 20 38.0	2 50 58.2	12 44.1	5 18 8.4	13 38.5	9.661 9730	9.953 3350	9.949 6606
4	279 12 27.6	2 52 43.4	12 29.1	5 31 26.6	12 57.6	9.659 9173	9.945 9480	9.942 1981
5	282 6 9.3	2 54 42.3	12 6.3	5 44 2.8	12 14.3	9.657 5964	9.938 4119	9.934 5903
6	285 1 57.0	2 56 55.4	+ 11 35.8	- 5 55 54.3	- 11 28.2	9.655 0093	9.930 7344	9.926 8460
7	288 0 5.0	2 59 23.2	10 57.6	6 6 58.2	10 39.1	9.652 1551	9.922 9267	9.918 9781
8	291 0 48.3	3 2 6.1	10 11.5	6 17 11.4	9 46.7	9.649 0330	9.915 0027	9.911 0031
9	294 4 22.4	3 5 4.8	9 17.8	6 26 30.3	8 50.6	9.645 6424	9.906 9819	9.902 9422
10	297 11 3.3	3 8 19.7	8 16.8	6 34 51.2	7 50.5	9.641 9829	9.898 8877	9.894 8226
11	300 21 7.6	3 11 51.7	+ 7 8.7	- 6 42 9.8	- 6 46.0	9.638 0547	9.890 7512	9.886 6782
12	303 34 52.6	3 15 41.4	5 54.0	6 48 21.5	5 36.6	9.633 8585	9.882 6091	9.878 5501
13	306 52 36.4	3 19 49.3	4 33.2	6 53 21.2	4 21.9	9.629 3959	9.874 5076	9.870 4890
14	310 14 37.6	3 24 16.3	3 6.9	6 57 3.4	3 1.5	9.624 6691	9.866 5020	9.862 5554
15	313 41 15.6	3 29 3.1	1 36.0	6 59 22.2	1 34.9	9.619 6817	9.858 6584	9.854 8212
16	317 12 50.7	3 34 10.4	+ 0 1.6	- 7 0 11.1	- 0 1.6	9.614 4385	9.851 0546	9.847 3703
17	320 49 43.6	3 39 38.8	- 1 35.2	6 59 23.1	+ 1 38.9	9.608 9462	9.843 7807	9.840 2992
18	324 32 15.7	3 45 28.9	3 13.0	6 56 50.7	3 27.1	9.603 2138	9.836 9400	9.833 7177
19	328 20 48.9	3 51 41.2	4 50.1	6 52 26.2	5 23.3	9.597 2520	9.830 6479	9.827 7467
20	332 15 45.6	3 58 16.0	6 24.6	6 46 1.3	7 27.9	9.591 0751	9.825 0309	9.822 5179
21	336 17 28.3	4 5 13.2	- 7 54.4	- 6 37 27.5	+ 9 41.1	9.584 7007	9.820 2251	9.818 1700
22	340 26 19.5	4 12 32.8	9 17.2	6 26 36.1	12 3.0	9.578 1504	9.816 3706	9.814 8445
23	344 42 41.3	4 20 14.3	10 30.3	6 13 18.6	14 33.4	9.571 4503	9.813 6084	9.812 6787
24	349 6 55.0	4 28 16.5	11 31.1	5 57 26.6	17 11.9	9.564 6317	9.812 0710	9.811 7998
25	353 39 20.7	4 36 38.0	12 16.8	5 38 52.3	19 57.7	9.557 7318	9.811 8781	9.812 3167
26	358 20 16.5	4 45 16.4	- 12 44.6	- 5 17 29.2	+ 22 49.4	9.550 7941	9.813 1250	9.814 3103
27	3 9 58.1	4 54 8.9	12 52.0	4 53 12.1	25 45.4	9.543 8689	9.815 8777	9.817 8296
28	8 8 37.5	5 3 11.4	12 36.7	4 25 57.9	28 43.1	9.537 0139	9.820 1656	9.822 8825
29	13 16 22.5	5 12 19.0	11 57.1	3 55 46.4	31 39.4	9.530 2943	9.825 9752	9.829 4358
30	18 33 15.2	5 21 25.8	10 52.2	3 22 40.9	34 30.4	9.523 7818	9.833 2538	9.837 4158
Oct. 1	23 59 11.4	5 30 24.6	- 9 22.3	- 2 46 48.9	+ 37 11.6	9.517 5549	9.841 9068	9.846 7097
	29 33 58.8	5 39 7.0	- 7 28.9	- 2 8 22.8	+ 39 37.7	9.511 6971	9.851 8056	9.857 1736

MERCURY.									
GREENWICH MEAN NOON.									
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Intermediate Date.	
Oct.	1 29 33 58.8	5 39 7.0	— 7 28.9	— 2 8 22.8	+ 39 37.7	9.511 6971	9.851 8056	9.857 1736	
	2 35 17 16.8	5 47 24.0	5 14.8	1 27 40.5	41 43.0	9.506 2953	9.862 7924	9.868 6394	
	3 41 8 35.0	5 55 5.4	2 44.6	0 45 5.7	43 21.7	9.501 4376	9.874 6913	9.880 9242	
	4 47 7 12.3	6 2 0.5	— 0 4.2	— 0 1 7.9	44 28.1	9.497 2096	9.887 3144	9.893 8382	
	5 53 12 17.1	6 7 58.8	+ 2 39.3	+ 0 43 38.1	44 57.1	9.493 6914	9.900 4722	9.907 1934	
	6 59 22 47.6	6 12 50.2	+ 5 17.8	+ 1 28 32.8	+ 44 45.0	9.490 9538	9.913 9798	9.920 8101	
	7 65 37 32.1	6 16 25.5	7 43.0	2 12 53.6	43 49.2	9.489 0548	9.927 6640	9.934 5222	
	8 71 55 10.6	6 18 37.2	9 46.9	2 55 56.7	42 9.6	9.488 0360	9.941 3667	9.948 1804	
	9 78 14 16.9	6 19 00.3	11 22.6	3 36 58.9	39 47.8	9.487 9201	9.954 9477	9.961 6541	
	10 84 33 21.0	6 18 32.6	12 25.2	4 15 19.7	36 47.6	9.488 7098	9.968 2867	9.974 8336	
	11 90 50 52.0	6 16 14.4	+ 12 51.5	+ 4 50 23.3	+ 33 14.7	9.490 3874	9.981 2844	9.987 6296	
	12 97 5 20.9	6 18 29.3	12 40.9	5 21 40.5	29 16.0	9.492 9157	9.993 8612	9.999 9722	
	13 103 15 23.8	6 7 23.8	11 55.2	5 48 49.3	24 59.3	9.496 2408	0.005 9565	0.011 8092	
	14 109 19 44.4	6 1 6.2	10 38.1	6 11 35.8	20 32.7	9.500 2950	0.017 5264	0.023 1049	
	15 115 17 15.6	5 53 46.9	8 54.8	6 29 53.9	16 3.7	9.505 0001	0.028 5425	0.033 8377	
	16 121 7 1.4	5 45 37.2	+ 6 51.5	+ 6 43 44.7	+ 11 39.1	9.510 2713	0.038 9894	0.043 9974	
	17 126 48 17.0	5 36 48.7	4 35.0	6 53 15.5	7 24.6	9.516 0209	0.048 8619	0.053 5836	
	18 132 20 29.5	5 27 32.7	+ 2 11.8	6 58 38.7	+ 3 24.6	9.522 1616	0.058 1636	0.062 6035	
	19 137 43 16.7	5 17 59.8	— 0 12.0	7 0 10.4	— 0 18.0	9.528 6087	0.066 9052	0.071 0707	
	20 142 56 26.7	5 8 19.7	2 31.2	6 58 9.1	3 41.1	9.535 2825	0.075 1022	0.079 0022	
	21 147 59 56.4	4 58 40.6	— 4 41.4	+ 6 52 54.9	— 6 43.8	9.542 1094	0.082 7734	0.086 4184	
	22 152 53 50.3	4 49 9.2	6 39.3	6 44 48.3	9 26.0	9.549 0223	0.089 9401	0.093 3413	
	23 157 38 19.3	4 39 51.4	8 22.5	6 34 9.5	11 48.4	9.555 9618	0.096 6251	0.099 7943	
	24 162 13 39.1	4 30 51.4	9 49.4	6 21 17.9	13 51.9	9.562 8758	0.102 8518	0.105 8007	
	25 166 40 9.2	4 22 12.5	10 59.2	6 6 31.6	15 37.8	9.569 7190	0.108 6437	0.111 3836	
	26 170 58 11.8	4 13 56.9	— 11 51.8	+ 5 50 7.6	— 17 7.6	9.576 4527	0.114 0231	0.116 5651	
	27 175 8 11.2	4 6 6.2	12 27.7	5 32 21.2	18 22.9	9.583 0439	0.119 0124	0.121 3678	
	28 179 10 32.7	3 58 41.0	12 47.5	5 13 26.2	19 25.1	9.589 4653	0.123 6334	0.125 8117	
	29 183 5 42.0	3 51 41.8	12 52.1	4 53 34.8	20 15.8	9.595 6943	0.127 9051	0.129 9159	
	30 186 54 5.0	3 45 8.5	12 42.7	4 32 58.0	20 56.2	9.601 7124	0.131 8466	0.133 6991	
	31 190 36 7.4	3 39 0.5	— 12 20.7	+ 4 11 45.4	— 21 27.7	9.607 5046	0.135 4754	0.137 1778	
Nov.	1 194 12 14.3	3 33 17.3	11 47.4	3 50 5.2	21 51.4	9.613 0592	0.138 8081	0.140 3680	
	2 197 42 50.0	3 27 58.1	11 4.1	3 28 4.7	22 8.4	9.618 3667	0.141 8593	0.143 2837	
	3 201 8 18.2	3 23 2.1	10 12.2	3 5 50.3	22 19.5	9.623 4200	0.144 6428	0.145 9382	
	4 204 29 1.5	3 18 28.3	9 13.0	2 43 27.4	22 25.5	9.628 2137	0.147 1714	0.148 3438	
	5 207 45 21.7	3 14 15.6	— 8 7.8	+ 2 21 0.7	— 22 27.2	9.632 7441	0.149 4566	0.150 5112	
	6 210 57 39.5	3 10 23.3	6 57.7	1 58 34.3	22 25.1	9.637 0086	0.151 5089	0.152 4508	
	7 214 6 14.8	3 6 50.4	5 43.8	1 36 11.6	22 19.8	9.641 0054	0.153 3379	0.154 1713	
	8 217 11 26.5	3 3 36.0	4 27.2	1 13 55.7	22 11.7	9.644 7336	0.154 9518	0.155 6805	
	9 220 13 32.7	3 0 39.4	3 8.8	0 51 49.1	22 1.2	9.648 1929	0.156 3584	0.156 9864	
	10 223 12 50.9	2 57 59.7	— 1 49.5	+ 0 29 54.1	— 21 48.5	9.651 3837	0.157 5651	0.158 0950	
	11 226 9 37.5	2 55 36.1	— 0 30.1	+ 0 8 12.7	21 34.0	9.654 3064	0.158 5770	0.159 0118	
	12 229 4 8.4	2 53 28.2	+ 0 48.5	— 0 13 13.3	21 17.9	9.656 9617	0.159 4000	0.159 7422	
	13 231 56 38.9	2 51 35.2	2 5.8	0 34 22.5	21 0.3	9.659 3506	0.160 0389	0.160 2904	
	14 234 47 23.6	2 49 56.6	3 21.0	0 55 13.5	20 41.4	9.661 4740	0.160 4973	0.160 6599	
	15 237 36 36.7	2 48 32.0	+ 4 33.6	— 1 15 45.0	— 20 21.4	9.663 3331	0.160 7786	0.160 8537	
	16 240 24 32.0	2 47 20.9	+ 5 42.9	— 1 35 55.9	— 20 0.2	9.664 9288	0.160 8856	0.160 8744	

## MERCURY.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
Nov. 16	240 24 32.0	2 47 20.9	+ 5 42.9	- 1 35 55.9	- 20 0.2	9.664 9288	0.160 8856	0.160 8744
17	243 11 22.9	2 46 23.0	6 48.6	1 55 45.1	19 37.9	9.666 2618	0.160 8204	0.160 7237
18	245 57 22.3	2 45 38.0	7 50.1	2 15 11.5	19 14.6	9.667 3331	0.160 5845	0.160 4028
19	248 42 43.1	2 45 5.6	8 46.9	2 34 14.1	18 50.3	9.668 1434	0.160 1787	0.159 9122
20	251 27 37.7	2 44 45.6	9 38.7	2 52 51.8	18 24.9	9.668 6932	0.159 6034	0.159 2521
21	254 12 18.5	2 44 38.0	+ 10 25.1	- 3 11 3.6	- 17 58.4	9.668 9826	0.158 8583	0.158 4220
22	256 56 57.8	2 44 42.6	11 5.6	3 28 48.3	17 30.8	9.669 0119	0.157 9430	0.157 4210
23	259 41 47.8	2 44 59.4	11 40.1	3 46 4.8	17 2.0	9.668 7813	0.156 8559	0.156 2475
24	262 27 0.7	2 45 28.4	12 8.2	4 2 52.0	16 31.9	9.668 2906	0.155 5954	0.154 8994
25	265 12 48.7	2 46 9.7	12 29.6	4 19 8.3	16 0.4	9.667 5394	0.154 1590	0.153 3739
26	267 59 24.2	2 47 3.4	+ 12 44.1	- 4 34 52.2	- 15 27.3	9.666 5273	0.152 5437	0.151 6681
27	270 46 59.7	2 48 9.7	12 51.4	4 50 2.3	14 52.5	9.665 2535	0.150 7464	0.149 7782
28	273 35 47.9	2 49 28.8	12 51.3	5 4 36.7	14 15.9	9.663 7173	0.148 7630	0.147 7001
29	276 26 1.7	2 51 1.0	12 43.7	5 18 33.4	13 37.2	9.661 9178	0.146 5887	0.145 4284
30	279 17 54.3	2 52 46.6	12 28.5	5 31 50.4	12 56.3	9.659 8542	0.144 2186	0.142 9584
Dec. 1	282 11 39.4	2 54 45.9	+ 12 5.6	- 5 44 25.2	- 12 12.9	9.657 5254	0.141 6469	0.140 2833
2	285 7 30.9	2 56 59.4	12 34.8	5 56 15.2	11 26.7	9.654 9303	0.138 8668	0.137 3964
3	288 5 43.2	2 59 27.6	10 56.2	6 7 17.6	10 37.5	9.652 0680	0.135 8712	0.134 2902
4	291 6 31.2	3 2 11.1	10 9.9	6 17 29.2	9 45.0	9.648 9379	0.132 6524	0.130 9566
5	294 10 10.5	3 5 10.2	9 16.1	6 26 46.4	8 48.8	9.645 5393	0.129 2017	0.127 3863
6	297 16 57.1	3 8 25.6	+ 8 14.9	- 6 35 5.4	- 7 48.6	9.641 8718	0.125 5093	0.123 5693
7	300 27 7.5	3 11 58.1	7 6.6	6 42 22.1	6 43.9	9.637 9356	0.121 5650	0.119 4950
8	303 40 59.2	3 15 48.3	5 51.7	6 48 31.7	5 34.4	9.633 7314	0.117 3578	0.115 1518
9	306 58 50.2	3 19 56.9	4 30.7	6 53 29.1	4 19.6	9.629 2607	0.112 8755	0.110 5272
10	310 20 59.3	3 24 24.5	3 4.2	6 57 8.9	2 59.0	9.624 5259	0.108 1052	0.105 6076
11	313 47 45.8	3 29 11.9	+ 1 33.2	- 6 59 25.1	- 1 32.2	9.619 5306	0.103 0328	0.100 3788
12	317 19 29.9	3 34 19.8	- 0 1.3	7 0 11.1	+ 0 1.3	9.614 2797	0.097 6436	0.094 8251
13	320 56 32.4	3 39 48.8	1 38.2	6 59 20.0	1 42.1	9.608 7800	0.091 9215	0.088 9309
14	324 39 14.8	3 45 39.6	3 16.0	6 56 44.4	3 30.5	9.603 0402	0.085 8509	0.082 6791
15	328 27 59.1	3 51 52.6	4 53.0	6 52 16.4	5 26.9	9.597 0716	0.079 4134	0.076 0515
16	332 23 7.5	3 58 28.0	- 6 27.4	- 6 45 47.7	+ 7 31.8	9.590 8884	0.072 5912	0.069 0301
17	336 25 2.6	4 5 25.9	7 57.0	6 37 9.9	9 45.3	9.584 5082	0.065 3659	0.061 5963
18	340 34 6.8	4 12 46.2	9 19.5	6 26 14.3	12 7.4	9.577 9527	0.057 7190	0.053 7317
19	344 50 42.3	4 20 28.3	10 32.3	6 12 52.3	14 38.0	9.571 2481	0.049 6323	0.045 4187
20	349 15 10.4	4 28 31.2	11 32.7	5 56 55.5	17 16.8	9.564 4259	0.041 0888	0.036 6407
21	353 47 51.1	4 36 53.3	- 12 17.9	- 5 38 16.2	+ 20 2.8	9.557 5236	0.032 0726	0.027 3832
22	358 29 2.5	4 45 32.2	12 45.1	5 16 47.9	22 54.7	9.550 5849	0.022 5714	0.017 6362
23	3 19 0.0	4 54 25.0	12 51.9	4 52 25.5	25 50.7	9.543 6605	0.012 5771	0.007 3939
24	8 17 55.7	5 3 27.8	12 35.9	4 25 5.9	28 48.4	9.536 8082	0.002 0868	9.996 6570
25	13 25 57.2	5 12 35.6	11 55.5	3 54 49.1	31 44.6	9.530 0931	9.991 1063	9.985 4368
26	18 43 6.5	5 21 42.3	- 10 49.8	- 3 21 38.5	+ 34 35.5	9.523 5874	9.979 6517	9.973 7555
27	24 9 19.0	5 30 40.8	9 19.2	2 45 41.6	37 16.3	9.517 3697	9.967 7533	9.961 6518
28	29 44 22.5	5 39 22.8	7 25.1	2 7 11.0	39 41.9	9.511 5236	9.955 4584	9.949 1825
29	35 27 55.8	5 47 38.9	5 10.5	1 26 24.9	41 46.4	9.506 1361	9.942 8348	9.936 4280
30	41 19 28.2	5 55 19.0	- 2 39.9	- 0 43 47.1	43 24.2	9.501 2954	9.929 9760	9.923 4953
31	47 18 18.4	6 2 12.7	+ 0 0.8	+ 0 0 12.7	+ 44 29.6	9.497 0868	9.917 0038	9.910 5214
32	53 23 34.6	6 8 9.2	+ 2 44.2	+ 0 44 59.6	+ 44 57.4	9.493 5905	9.904 0702	9.897 6746

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
Jan. 0	73 14 27.4	1 36 40.7	— 0 16.6	— 0 9 21.5	+ 5 43.6	9.857 7181	9.663 2018	9.656 6363
2	76 27 52.4	1 36 44.3	+ 0 3.6	+ 0 2 6.5	5 44.1	9.857 5813	9.650 0198	9.643 3543
4	79 41 24.7	1 36 47.9	0 24.1	0 13 34.5	5 43.5	9.857 4497	9.636 6420	9.629 8859
6	82 55 4.1	1 36 51.5	0 44.1	0 25 0.3	5 41.9	9.857 3241	9.623 0891	9.616 2552
8	86 8 50.7	1 36 55.0	1 3.6	0 36 21.7	5 39.2	9.857 2049	9.609 3882	9.602 4925
10	89 22 44.2	1 36 58.5	+ 1 22.3	+ 0 47 36.6	+ 5 35.3	9.857 0924	9.595 5731	9.588 6357
12	92 36 44.7	1 37 2.0	1 39.9	0 58 42.7	5 30.4	9.856 9868	9.581 6866	9.574 7329
14	95 50 51.9	1 37 5.3	1 56.3	1 9 37.9	5 24.4	9.856 8887	9.567 7823	9.560 8437
16	99 5 5.7	1 37 8.5	2 11.2	1 20 20.1	5 17.4	9.856 7984	9.553 9268	9.547 0425
18	102 19 25.7	1 37 11.6	2 24.5	1 30 47.1	5 9.3	9.856 7161	9.540 2027	9.533 4206
20	105 33 51.8	1 37 14.5	+ 2 35.9	+ 1 40 57.0	+ 5 0.2	9.856 6421	9.526 7102	9.520 0866
22	108 48 23.8	1 37 17.3	2 45.3	1 50 47.7	4 50.1	9.856 5766	9.513 5662	9.507 1664
24	112 3 1.1	1 37 19.9	2 52.5	2 0 17.2	4 39.1	9.856 5199	9.500 9057	9.494 8036
26	115 17 43.4	1 37 22.3	2 57.6	2 9 23.8	4 27.2	9.856 4722	9.488 8803	9.483 1568
28	118 32 30.3	1 37 24.5	3 0.4	2 18 5.6	4 14.4	9.856 4336	9.477 6545	9.472 3954
30	121 47 21.3	1 37 26.5	+ 3 0.9	+ 2 26 20.9	+ 4 0.7	9.856 4043	9.467 4017	9.462 6958
Feb. 1	125 2 16.0	1 37 28.2	2 59.1	2 34 8.1	3 46.2	9.856 3843	9.458 3000	9.454 2362
3	128 17 13.9	1 37 29.6	2 55.0	2 41 25.6	3 31.0	9.856 3737	9.450 5254	9.447 1876
5	131 32 14.3	1 37 30.7	2 48.6	2 48 12.1	3 15.1	9.856 3726	9.444 2418	9.441 7054
7	134 47 16.7	1 37 31.5	2 40.0	2 54 26.1	2 58.6	9.856 3811	9.439 5936	9.437 9193
9	138 2 20.5	1 37 32.1	+ 2 29.4	+ 3 0 6.4	+ 2 41.5	9.856 3990	9.436 6933	9.435 9238
11	141 17 24.9	1 37 32.3	2 16.9	3 5 12.0	2 23.9	9.856 4262	9.435 6162	9.435 7734
13	144 32 29.4	1 37 32.1	2 2.6	3 9 41.9	2 5.8	9.856 4627	9.436 3951	9.437 4784
15	147 47 33.3	1 37 31.6	1 46.7	3 13 35.1	1 47.3	9.856 5085	9.439 0176	9.441 0045
17	151 2 35.8	1 37 30.8	1 29.4	3 16 51.0	1 28.5	9.856 5632	9.443 4280	9.446 2745
19	154 17 36.3	1 37 29.6	+ 1 11.0	+ 3 19 28.9	+ 1 9.4	9.856 6268	9.449 5279	9.453 1702
21	157 32 34.1	1 37 28.0	0 51.8	3 21 28.4	0 50.1	9.856 6991	9.457 1822	9.461 5433
23	160 47 28.4	1 37 26.1	0 31.9	3 22 49.1	0 30.6	9.856 7797	9.466 2314	9.471 2240
25	164 2 18.5	1 37 23.9	+ 0 11.6	3 23 30.7	+ 0 11.0	9.856 8685	9.476 4983	9.482 0314
27	167 17 3.7	1 37 21.3	— 0 8.9	3 23 33.2	— 0 8.5	9.856 9651	9.487 8006	9.493 7836
Mar. 1	170 31 43.5	1 37 18.3	— 0 29.2	+ 3 22 56.7	— 0 28.0	9.857 0693	9.499 9586	9.506 3046
3	173 46 17.1	1 37 15.1	0 49.2	3 21 41.3	0 47.4	9.857 1806	9.512 8016	9.519 4306

## VENUS.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
Apr.	2 222 6 46.7	1 36 1.6	-2 47.3	+1 53 14.2	-4 43.7	9.859 4209	9.718 8001	9.725 0608
	4 225 18 44.5	1 35 56.2	2 38.6	1 43 36.7	4 53.6	9.859 5864	9.731 2577	9.737 3905
	6 228 30 31.5	1 35 50.9	2 27.9	1 33 40.3	5 2.6	9.859 7509	9.743 4592	9.749 4637
	8 231 42 8.0	1 35 45.7	2 15.3	1 23 26.8	5 10.6	9.859 9140	9.755 4042	9.761 2809
	10 234 53 34.3	1 35 40.6	2 1.1	1 12 58.2	5 17.6	9.860 0752	9.767 0944	9.772 8452
	12 238 4 50.6	1 35 35.7	-1 45.4	+1 2 16.6	-5 23.7	9.860 2339	9.778 5339	9.784 1613
	14 241 15 57.3	1 35 31.0	1 28.4	0 51 23.9	5 28.7	9.860 3898	9.789 7280	9.795 2349
	16 244 26 54.7	1 35 26.5	1 10.3	0 40 22.2	5 32.7	9.860 5423	9.800 6826	9.806 0719
	18 247 37 43.4	1 35 22.2	0 51.4	0 29 13.4	5 35.7	9.860 6909	9.811 4032	9.816 6772
	20 250 48 23.7	1 35 18.1	0 31.9	0 17 59.7	5 37.7	9.860 8353	9.821 8945	9.827 0556
	22 253 58 56.1	1 35 14.3	-0 12.0	+0 6 43.1	-5 38.6	9.860 9749	9.832 1611	9.837 2116
	24 257 9 21.1	1 35 10.8	+0 8.1	-0 4 34.3	5 38.5	9.861 1093	9.842 2076	9.847 1496
	26 260 19 39.3	1 35 7.5	0 28.1	0 15 50.4	5 37.3	9.861 2381	9.852 0381	9.856 8736
	28 263 29 51.3	1 35 4.5	0 47.6	0 27 3.3	5 35.2	9.861 3610	9.861 6566	9.866 3876
	30 266 39 57.5	1 35 1.8	1 6.6	0 38 10.8	5 32.0	9.861 4776	9.871 0670	9.875 6954
May	2 269 49 58.6	1 34 59.4	+1 24.8	-0 49 11.0	-5 27.8	9.861 5874	9.880 2732	9.884 8010
	4 272 59 55.1	1 34 57.2	1 42.0	1 0 1.8	5 22.7	9.861 6902	9.889 2793	9.893 7086
	6 276 9 47.7	1 34 55.4	1 57.9	1 10 41.3	5 16.6	9.861 7858	9.898 0895	9.902 4226
	8 279 19 36.9	1 34 53.9	2 12.3	1 21 7.7	5 9.5	9.861 8737	9.906 7084	9.910 9476
	10 282 29 23.3	1 34 52.6	2 25.1	1 31 19.0	5 1.5	9.861 9537	9.915 1410	9.919 2895
	12 285 39 7.5	1 34 51.7	+2 36.1	-1 41 13.4	-4 52.6	9.862 0257	9.923 3938	9.927 4545
	14 288 48 50.0	1 34 51.0	2 45.3	1 50 49.1	4 42.9	9.862 0894	9.931 4723	9.935 4480
	16 291 58 31.4	1 34 50.6	2 52.4	2 0 4.5	4 32.3	9.862 1445	9.939 3823	9.943 2756
	18 295 8 12.3	1 34 50.4	2 57.4	2 8 57.8	4 20.8	9.862 1910	9.947 1284	9.950 9412
	20 298 17 53.1	1 34 50.5	3 0.3	2 17 27.5	4 8.6	9.862 2287	9.954 7146	9.958 4491
	22 301 27 34.4	1 34 50.9	+3 1.0	-2 25 32.0	-3 55.7	9.862 2574	9.962 1451	9.965 8029
	24 304 37 16.6	1 34 51.5	2 59.4	2 33 9.9	3 42.0	9.862 2772	9.969 4229	9.973 0055
June	2 307 47 0.2	1 34 52.3	2 55.7	2 40 19.9	3 27.7	9.862 2879	9.976 5511	9.980 0600
	4 310 56 45.6	1 34 53.3	2 49.9	2 47 0.6	3 12.8	9.862 2895	9.983 5325	9.986 9688
	6 314 6 33.3	1 34 54.5	2 42.0	2 53 10.8	2 57.3	9.862 2820	9.990 3693	9.993 7342
	8 317 16 23.5	1 34 55.9	+2 32.1	-2 58 49.4	-2 41.2	9.862 2655	9.997 0638	0.000 3583
	10 320 26 16.7	1 34 57.4	2 20.3	3 3 55.4	2 24.7	9.862 2400	0.003 6181	0.006 8437
	12 323 36 13.1	1 34 59.2	2 6.9	3 8 27.9	2 7.7	9.862 2055	0.010 0353	0.013 1934
	14 326 46 13.2	1 35 1.0	1 51.9	3 12 25.9	1 50.3	9.862 1622	0.016 3182	0.019 4101
	16 329 56 17.2	1 35 3.0	1 35.5	3 15 48.8	1 32.5	9.862 1102	0.022 4697	0.025 4974
	18 333 6 25.3	1 35 5.2	+1 18.0	-3 18 35.9	-1 14.5	9.862 0496	0.028 4936	0.031 4588
	20 336 16 37.7	1 35 7.4	0 59.5	3 20 46.6	0 56.2	9.861 9806	0.034 3935	0.037 2981
	22 339 26 54.7	1 35 9.7	0 40.2	3 22 20.6	0 37.7	9.861 9035	0.040 1729	0.043 0183
	24 342 37 16.4	1 35 12.1	0 20.5	3 23 17.5	0 19.1	9.861 8184	0.045 8345	0.048 6219
July	2 345 47 43.1	1 35 14.6	+0 0.5	3 23 37.1	-0 0.4	9.861 7257	0.051 3807	0.054 1113
	4 348 58 14.9	1 35 17.2	-0 19.5	-3 23 19.3	+0 18.3	9.861 6256	0.056 8138	0.059 4886
	6 352 8 51.9	1 35 19.9	0 39.3	3 22 24.1	0 36.9	9.861 5183	0.062 1358	0.064 7557
	8 355 19 34.3	1 35 22.6	0 58.6	3 20 51.6	0 55.5	9.861 4042	0.067 3483	0.069 9139
	10 358 30 22.1	1 35 25.4	1 17.2	3 18 42.0	1 14.0	9.861 2837	0.072 4525	0.074 9643
	12 361 41 15.5	1 35 28.2	1 34.8	3 15 55.7	1 32.2	9.861 1571	0.077 4495	0.079 9082
	14 364 52 14.6	1 35 31.0	-1 51.3	-3 12 33.1	+1 50.2	9.861 0247	0.082 3404	0.084 7463

VENUS.									
GREENWICH MEAN NOON.									
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Intermediate Date.	
July	° ' "	° ' "	° ' "	° ' "	° ' "				
	4 52 14.6	1 35 31.0	- 1 51.3	- 3 12 33.1	+ 1 50.2	9.861 0247	0.082 3404	0.084 7463	
	8 3 19.4	1 35 33.9	2 6.5	3 8 34.8	2 8.0	9.860 8871	0.087 1261	0.089 4799	
	11 14 30.0	1 35 36.8	2 20.1	3 4 1.4	2 25.3	9.860 7446	0.091 8079	0.094 1104	
	14 25 46.5	1 35 39.8	2 31.9	2 58 53.8	2 42.2	9.860 5976	0.096 3878	0.098 6403	
	17 37 9.1	1 35 42.8	2 41.9	2 53 12.7	2 58.7	9.860 4466	0.100 8681	0.103 0716	
	20 48 37.8	1 35 45.9	- 2 49.9	- 2 46 59.2	+ 3 14.6	9.860 2920	0.105 2510	0.107 4067	
	24 0 12.6	1 35 49.0	2 55.8	2 40 14.4	3 30.0	9.860 1344	0.109 5388	0.111 6475	
	27 11 53.6	1 35 52.1	2 59.5	2 32 59.5	3 44.7	9.859 9742	0.113 7332	0.115 7960	
	30 23 41.0	1 35 55.3	3 1.0	2 25 15.7	3 58.8	9.859 8119	0.117 8362	0.119 8540	
	33 35 34.7	1 35 58.5	3 0.2	2 17 4.5	4 12.2	9.859 6480	0.121 8496	0.123 8232	
	36 47 34.9	1 36 1.8	- 2 57.2	- 2 8 27.3	+ 4 24.8	9.859 4829	0.125 7749	0.127 7048	
	39 59 41.7	1 36 5.1	2 52.0	1 59 25.6	4 36.6	9.859 3173	0.129 6131	0.131 4999	
	43 11 55.2	1 36 8.4	2 44.6	1 50 1.2	4 47.6	9.859 1516	0.133 3653	0.135 2091	
	46 24 15.4	1 36 11.8	2 35.1	1 40 15.7	4 57.7	9.858 9864	0.137 0316	0.138 8328	
	49 36 42.3	1 36 15.2	2 23.7	1 30 10.9	5 6.9	9.858 8222	0.140 6129	0.142 3718	
	52 49 16.2	1 36 18.7	- 2 10.5	- 1 19 48.7	+ 5 15.1	9.858 6595	0.144 1095	0.145 8262	
Aug.	56 1 57.1	1 36 22.2	1 55.7	1 9 11.0	5 22.3	9.858 4987	0.147 5219	0.149 1966	
	59 14 45.0	1 36 25.7	1 39.3	0 58 19.8	5 28.6	9.858 3405	0.150 8507	0.152 4844	
	62 27 39.9	1 36 29.3	1 21.7	0 47 17.1	5 33.8	9.858 1853	0.154 0977	0.155 6908	
	65 40 42.0	1 36 32.9	1 3.1	0 36 5.0	5 38.0	9.858 0337	0.157 2639	0.158 8172	
	68 53 51.4	1 36 36.5	- 0 43.7	- 0 24 45.6	+ 5 41.1	9.857 8860	0.160 3510	0.161 8656	
	72 7 8.0	1 36 40.1	0 23.7	0 13 21.1	5 43.1	9.857 7428	0.163 3610	0.164 8375	
	75 20 31.8	1 36 43.7	- 0 3.4	- 0 1 53.6	5 44.0	9.857 6045	0.166 2952	0.167 7342	
	78 34 2.7	1 36 47.3	+ 0 17.0	+ 0 9 34.7	5 43.8	9.857 4717	0.169 1548	0.170 5570	
	81 47 40.8	1 36 50.8	0 37.2	0 21 1.6	5 42.6	9.857 3446	0.171 9410	0.173 3070	
	85 1 26.1	1 36 54.4	+ 0 56.9	+ 0 32 24.9	+ 5 40.3	9.857 2237	0.174 6551	0.175 9854	
Sept.	88 15 18.4	1 36 57.9	1 15.9	0 43 42.3	5 36.8	9.857 1095	0.177 2980	0.178 5929	
	91 29 17.5	1 37 1.3	1 33.9	0 54 51.8	5 32.3	9.857 0023	0.179 8702	0.181 1298	
	94 43 23.4	1 37 4.6	1 50.8	1 5 51.1	5 26.7	9.856 9024	0.182 3717	0.183 5960	
	97 57 35.9	1 37 7.8	2 6.2	1 16 38.1	5 20.0	9.856 8101	0.184 8028	0.185 9920	
	101 11 54.7	1 37 10.9	+ 2 20.0	+ 1 27 10.7	+ 5 12.3	9.856 7258	0.187 1638	0.188 3181	
	104 26 19.6	1 37 13.9	2 32.1	1 37 26.8	5 3.5	9.856 6498	0.189 4550	0.190 5746	
	107 40 50.3	1 37 16.7	2 42.2	1 47 24.4	4 53.8	9.856 5823	0.191 6770	0.192 7624	
	110 55 26.5	1 37 19.3	2 50.3	1 57 1.6	4 43.1	9.856 5236	0.193 8309	0.194 8827	
	114 10 7.8	1 37 21.8	2 56.1	2 6 16.4	4 31.5	9.856 4737	0.195 9180	0.196 9368	
	117 24 53.8	1 37 24.1	+ 2 59.7	+ 2 15 7.1	+ 4 18.9	9.856 4329	0.197 9393	0.198 9256	
Oct.	120 39 44.1	1 37 26.1	3 1.0	2 23 31.8	4 5.5	9.856 4013	0.199 8960	0.200 8506	
	123 54 38.1	1 37 27.8	3 0.0	2 31 28.9	3 51.4	9.856 3791	0.201 7895	0.202 7129	
	127 9 35.4	1 37 29.3	2 56.6	2 38 56.9	3 36.5	9.856 3663	0.203 6210	0.204 5139	
	130 24 35.4	1 37 30.5	2 51.0	2 45 54.4	3 20.8	9.856 3629	0.205 3916	0.206 2544	
	133 39 37.5	1 37 31.4	+ 2 43.2	+ 2 52 19.9	+ 3 4.5	9.856 3689	0.207 1024	0.207 9356	
	136 54 41.1	1 37 32.0	2 33.3	2 58 12.1	2 47.6	9.856 3844	0.208 7540	0.209 5578	
	140 9 45.6	1 37 32.3	2 21.5	3 3 29.9	2 30.1	9.856 4093	0.210 3469	0.211 1213	
	143 24 50.3	1 37 32.3	2 7.8	3 8 12.3	2 12.2	9.856 4435	0.211 8810	0.212 6260	
	146 39 54.6	1 37 31.9	1 52.4	3 12 18.4	1 53.8	9.856 4868	0.213 3562	0.214 0718	
	149 54 57.8	1 37 31.1	+ 1 35.6	+ 3 15 47.3	+ 1 35.1	9.856 5392	0.214 7728	0.215 4592	
Oct. 1	153 9 59.2	1 37 30.0	+ 1 17.6	+ 3 18 38.5	+ 1 16.1	9.856 6005	0.216 1311	0.216 7887	

VENUS.									
GREENWICH MEAN NOON.									
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—		
							At Date.	At Interme- diate Date.	
Oct. 1	153 9 59.2	1 37 30.0	+ 1 17.6	+ 3 18 38.5	+ 1 16.1	9.856 6005	0.216 1311	0.216 7887	
3	156 24 58.0	1 37 28.6	0 58.6	3 20 51.4	0 56.8	9.856 6704	0.217 4320	0.218 0610	
5	159 39 53.5	1 37 26.8	0 38.9	3 22 25.6	0 37.4	9.856 7488	0.218 6759	0.219 2768	
7	162 54 45.1	1 37 24.7	+ 0 18.7	3 23 20.8	+ 0 17.9	9.856 8354	0.219 8638	0.220 4371	
9	166 9 32.1	1 37 22.2	- 0 1.8	3 23 37.0	- 0 1.7	9.856 9299	0.220 9967	0.221 5428	
11	169 24 13.8	1 37 19.4	- 0 22.3	+ 3 23 14.1	- 0 21.2	9.857 0319	0.222 0756	0.222 5953	
13	172 38 49.6	1 37 16.2	0 42.4	3 22 12.2	0 40.6	9.857 1412	0.223 1019	0.223 5956	
15	175 53 18.7	1 37 12.8	1 1.9	3 20 31.6	0 59.9	9.857 2574	0.224 0766	0.224 5450	
17	179 7 40.6	1 37 9.0	1 20.7	3 18 12.6	1 18.9	9.857 3802	0.225 0008	0.225 4442	
19	182 21 54.7	1 37 5.0	1 38.5	3 15 15.8	1 37.7	9.857 5091	0.225 8752	0.226 2940	
21	185 36 0.5	1 37 0.7	- 1 54.9	+ 3 11 41.9	- 1 56.1	9.857 6437	0.226 7005	0.227 0948	
23	188 49 57.5	1 36 56.2	2 9.9	3 7 31.6	2 14.1	9.857 7835	0.227 4769	0.227 8467	
25	192 3 45.2	1 36 51.4	2 23.3	3 2 45.8	2 31.6	9.857 9282	0.228 2043	0.228 5496	
27	195 17 23.3	1 36 46.5	2 34.8	2 57 25.4	2 48.6	9.858 0773	0.228 8826	0.229 2033	
29	198 30 51.3	1 36 41.4	2 44.4	2 51 31.6	3 5.0	9.858 2302	0.229 5118	0.229 8081	
31	201 44 8.9	1 36 36.2	- 2 51.8	+ 2 45 5.5	- 3 20.8	9.858 3865	0.230 0922	0.230 3642	
Nov. 2	204 57 16.0	1 36 30.8	2 57.1	2 38 8.5	3 35.9	9.858 5457	0.230 6241	0.230 8721	
4	208 10 12.3	1 36 25.4	3 0.2	2 30 41.9	3 50.4	9.858 7073	0.231 1082	0.231 3325	
6	211 22 57.7	1 36 20.0	3 1.0	2 22 47.3	4 4.0	9.858 8707	0.231 5451	0.231 7461	
8	214 35 32.0	1 36 14.4	2 59.5	2 14 26.2	4 16.8	9.859 0355	0.231 9356	0.232 1138	
10	217 47 55.3	1 36 8.9	- 2 55.8	+ 2 5 40.2	- 4 28.8	9.859 2011	0.232 2807	0.232 4364	
12	221 0 7.6	1 36 3.5	2 49.9	1 56 31.1	4 40.0	9.859 3670	0.232 5810	0.232 7147	
14	224 12 9.0	1 35 58.0	2 41.8	1 47 0.6	4 50.2	9.859 5328	0.232 8377	0.232 9501	
16	227 23 59.6	1 35 52.7	2 31.8	1 37 10.5	4 59.5	9.859 6978	0.233 0519	0.233 1431	
18	230 35 39.6	1 35 47.4	2 19.9	1 27 2.8	5 7.9	9.859 8616	0.233 2238	0.233 2942	
20	233 47 9.2	1 35 42.3	- 2 6.2	+ 1 16 39.3	- 5 15.3	9.860 0236	0.233 3543	0.233 4038	
22	236 58 28.8	1 35 37.4	1 51.0	1 6 2.0	5 21.7	9.860 1834	0.233 4428	0.233 4713	
24	240 9 38.6	1 35 32.6	1 34.5	0 55 12.9	5 27.1	9.860 3404	0.233 4892	0.233 4965	
26	243 20 39.0	1 35 28.0	1 16.8	0 44 14.1	5 31.5	9.860 4942	0.233 4933	0.233 4794	
28	246 31 30.4	1 35 23.6	0 58.1	0 33 7.6	5 34.8	9.860 6443	0.233 4549	0.233 4198	
30	249 42 13.3	1 35 19.5	- 0 38.7	+ 0 21 55.4	- 5 37.1	9.860 7903	0.233 3741	0.233 3177	
Dec. 2	252 52 48.2	1 35 15.6	- 0 18.9	+ 0 10 39.6	5 38.4	9.860 9317	0.233 2507	0.233 1732	
4	256 3 15.5	1 35 11.9	+ 0 1.1	- 0 0 37.7	5 38.6	9.861 0680	0.233 0851	0.232 9865	
6	259 13 35.8	1 35 8.6	0 21.1	0 11 54.5	5 37.8	9.861 1989	0.232 8775	0.232 7582	
8	262 23 49.7	1 35 5.5	0 40.9	0 23 8.8	5 36.0	9.861 3240	0.232 6286	0.232 4888	
10	265 33 57.6	1 35 2.7	+ 1 0.1	- 0 34 18.4	- 5 33.2	9.861 4429	0.232 3388	0.232 1787	
12	268 44 0.2	1 35 0.2	1 18.6	0 45 21.3	5 29.4	9.861 5552	0.232 0086	0.231 8286	
14	271 53 58.0	1 34 58.0	1 36.1	0 56 15.6	5 24.6	9.861 6606	0.231 6388	0.231 4394	
16	275 3 51.6	1 34 56.0	1 52.4	1 6 59.3	5 18.8	9.861 7587	0.231 2304	0.231 0118	
18	278 13 41.7	1 34 54.3	2 7.4	1 17 30.5	5 12.1	9.861 8494	0.230 7835	0.230 5455	
20	281 23 28.8	1 34 53.0	+ 2 20.8	- 1 27 47.2	- 5 4.4	9.861 9323	0.230 2977	0.230 0401	
22	284 33 13.4	1 34 51.9	2 32.5	1 37 47.7	4 55.8	9.862 0071	0.229 7728	0.229 4956	
24	287 42 56.1	1 34 51.1	2 42.3	1 47 30.2	4 46.3	9.862 0737	0.229 2084	0.228 9111	
26	290 52 37.6	1 34 50.6	2 50.1	1 56 52.8	4 36.0	9.862 1319	0.228 6038	0.228 2863	
28	294 2 18.4	1 34 50.4	2 55.9	2 5 54.0	4 24.9	9.862 1814	0.227 9585	0.227 6203	
30	297 11 58.9	1 34 50.4	+ 2 59.5	- 2 14 32.1	- 4 13.0	9.862 2222	0.227 2717	0.226 9127	
32	300 21 39.7	1 34 50.6	+ 3 1.0	- 2 22 45.6	- 4 0.3	9.862 2541	0.226 5435	0.226 1640	

MARS.												
GREENWICH MEAN NOON.												
Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
											At Date.	At Intermediate Date.
	°	'	"			°	'	"				
Jan. 0	58	11	31.7	32 29.71	+ 17.2	+ 0	18	0.8	+ 1 2.15	0.174 6955	9.996 4599	0.000 4304
2	59	16	24.4	32 22.97	19.1	0	20	4.7	1 1.77	0.175 4509	0.004 3765	0.008 2984
4	60	21	3.6	32 16.24	21.0	0	22	7.7	1 1.28	0.176 2062	0.012 1961	0.016 0695
6	61	25	29.4	32 9.54	22.8	0	24	9.8	1 0.82	0.176 9612	0.019 9187	0.023 7439
8	62	29	41.8	32 2.86	24.6	0	26	11.0	1 0.36	0.177 7157	0.027 5448	0.031 3214
10	63	33	40.9	31 56.20	+ 26.4	+ 0	28	11.3	+ 0 59.88	0.178 4693	0.035 0737	0.038 8018
12	64	37	26.6	31 49.58	28.1	0	30	10.5	0 59.36	0.179 2218	0.042 5056	0.046 1849
14	65	40	59.3	31 43.01	29.8	0	32	8.7	0 58.84	0.179 9730	0.049 8398	0.053 4701
16	66	44	18.8	31 36.49	31.4	0	34	5.9	0 58.30	0.180 7226	0.057 0758	0.060 6570
18	67	47	25.3	31 30.00	33.0	0	36	1.9	0 57.74	0.181 4703	0.064 2138	0.067 7463
20	68	50	18.9	31 23.54	+ 34.5	+ 0	37	56.8	+ 0 57.18	0.182 2159	0.071 2545	0.074 7385
22	69	52	59.5	31 17.12	36.0	0	39	50.6	0 56.59	0.182 9592	0.078 1986	0.081 6349
24	70	55	27.4	31 10.76	37.4	0	41	43.2	0 56.00	0.183 6999	0.085 0477	0.088 4374
26	71	57	42.6	31 4.44	38.8	0	43	34.6	0 55.39	0.184 4378	0.091 8041	0.095 1479
28	72	59	45.2	30 58.16	40.1	0	45	24.8	0 54.77	0.185 1727	0.098 4692	0.101 7680
30	74	1	35.3	30 51.94	+ 41.4	+ 0	47	13.7	+ 0 54.13	0.185 9044	0.105 0445	0.108 2988
Feb. 1	75	3	13.0	30 45.76	42.6	0	49	1.3	0 53.48	0.186 6327	0.111 5311	0.114 7415
3	76	4	38.4	30 39.64	43.7	0	50	47.7	0 52.83	0.187 3573	0.117 9300	0.121 0967
5	77	5	51.6	30 33.59	44.8	0	52	32.7	0 52.17	0.188 0780	0.124 2416	0.127 3653
7	78	6	52.8	30 27.57	45.8	0	54	16.3	0 51.50	0.188 7946	0.130 4671	0.133 5473
9	79	7	41.9	30 21.59	+ 46.8	+ 0	55	58.6	+ 0 50.81	0.189 5070	0.136 6059	0.139 6429
11	80	8	19.2	30 15.67	47.7	0	57	39.6	0 50.11	0.190 2149	0.142 6582	0.145 6518
13	81	8	44.7	30 9.83	48.6	0	59	19.1	0 49.41	0.190 9182	0.148 6239	0.151 5745
15	82	8	58.7	30 4.06	49.4	1	0	57.2	0 48.70	0.191 6167	0.154 5037	0.157 4115
17	83	9	1.1	29 58.34	50.1	1	2	33.9	0 47.98	0.192 3101	0.160 2978	0.163 1629
19	84	8	52.1	29 52.69	+ 50.7	+ 1	4	9.1	+ 0 47.25	0.192 9984	0.166 0071	0.168 8307
21	85	8	31.9	29 47.10	51.3	1	5	42.9	0 46.52	0.193 6812	0.171 6336	0.174 4159
23	86	8	0.6	29 41.56	51.8	1	7	15.2	0 45.78	0.194 3586	0.177 1779	0.179 9199
25	87	7	18.2	29 36.08	52.3	1	8	46.0	0 45.03	0.195 0303	0.182 6421	0.185 3449
27	88	6	24.9	29 30.67	52.7	1	10	15.3	0 44.28	0.195 6961	0.188 0282	0.190 6919
Mar. 1	89	5	21.0	29 25.33	+ 53.0	+ 1	11	43.1	+ 0 43.52	0.196 3559	0.193 3363	0.195 9616
3	90	4	6.4	29 20.06	53.3	1	13	9.4	0 42.75	0.197 0095	0.198 5678	0.201 1550
5	91	2	41.3	29 14.85	53.5	1	14	34.2	0 41.99	0.197 6568	0.203 7234	0.206 2731
7	92	1	5.8	29 9.71	53.7	1	15	57.4	0 41.21	0.198 2976	0.208 8041	0.211 3163
9	92	59	20.2	29 4.65	53.8	1	17	19.0	0 40.43	0.198 9319	0.213 8098	0.216 2846
11	93	57	24.4	28 59.64	+ 53.8	+ 1	18	39.1	+ 0 39.65	0.199 5595	0.218 7406	0.221 1779
13	94	55	18.8	28 54.70	53.8	1	19	57.6	0 38.87	0.200 1802	0.223 5964	0.225 9961
15	95	53	3.3	28 49.84	53.7	1	21	14.5	0 38.08	0.200 7938	0.228 3771	0.230 7395
17	96	50	38.2	28 45.04	53.5	1	22	29.9	0 37.28	0.201 4003	0.233 0834	0.235 4088
19	97	48	3.6	28 40.31	53.3	1	23	43.7	0 36.48	0.201 9996	0.237 7160	0.240 0056
21	98	45	19.5	28 35.66	+ 53.0	+ 1	24	55.9	+ 0 35.68	0.202 5916	0.242 2773	0.244 5312
23	99	42	26.3	28 31.09	52.7	1	26	6.4	0 34.88	0.203 1761	0.246 7674	0.248 9859
25	100	39	23.9	28 26.58	52.3	1	27	15.3	0 34.07	0.203 7529	0.251 1870	0.253 3709
27	101	36	12.6	28 22.14	51.8	1	28	22.7	0 33.27	0.204 3220	0.255 5379	0.257 6883
29	102	32	52.5	28 17.76	51.3	1	29	28.5	0 32.45	0.204 8833	0.259 8219	0.261 9386
31	103	29	23.7	28 13.46	+ 50.8	+ 1	30	32.6	+ 0 31.65	0.205 4367	0.264 0387	0.266 1225
Apr. 2	104	25	46.4	28 9.23	+ 50.2	+ 1	31	35.1	+ 0 30.84	0.205 9821	0.268 1898	0.270 2407



## MARS.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
Apr. 2	104	25	46.4	28 9.23	+ 50.2	+ 1	31	35.1	+ 0 30.84	0.205 9821	0.268 1898	0.270 2407
4	105	22	0.8	28 5.08	49.5	1	32	35.9	0 30.02	0.206 5193	0.272 2752	0.274 2935
6	106	18	6.9	28 1.01	48.8	1	33	35.1	0 29.20	0.207 0483	0.276 2956	0.278 2815
8	107	14	4.9	27 57.01	48.0	1	34	32.7	0 28.39	0.207 5690	0.280 2511	0.282 2044
10	108	9	55.1	27 53.09	47.2	1	35	28.7	0 27.57	0.208 0813	0.284 1415	0.286 0623
12	109	5	37.4	27 49.24	+ 46.3	+ 1	36	23.0	+ 0 26.75	0.208 5851	0.287 9670	0.289 8552
14	110	1	12.1	27 45.46	45.4	1	37	15.7	0 25.94	0.209 0804	0.291 7273	0.293 5834
16	110	56	39.3	27 41.76	44.5	1	38	6.7	0 25.12	0.209 5670	0.295 4235	0.297 2477
18	111	51	59.2	27 38.14	43.5	1	38	56.1	0 24.30	0.210 0448	0.299 0561	0.300 8489
20	112	47	11.9	27 34.59	42.5	1	39	43.9	0 23.48	0.210 5139	0.302 6263	0.304 3886
22	113	42	17.6	27 31.11	+ 41.4	+ 1	40	30.0	+ 0 22.65	0.210 9740	0.306 1357	0.307 8675
24	114	37	16.4	27 27.70	40.3	1	41	14.5	0 21.83	0.211 4252	0.309 5844	0.311 2866
26	115	32	8.4	27 24.36	39.1	1	41	57.4	0 21.01	0.211 8674	0.312 9740	0.314 6466
28	116	26	53.9	27 21.10	37.9	1	42	38.6	0 20.19	0.212 3005	0.316 3047	0.317 9483
30	117	21	32.9	27 17.91	36.7	1	43	18.1	0 19.38	0.212 7244	0.319 5774	0.321 1922
May 2	118	16	5.7	27 14.81	+ 35.4	+ 1	43	56.1	+ 0 18.56	0.213 1390	0.322 7928	0.324 3791
4	119	10	32.3	27 11.79	34.1	1	44	32.4	0 17.74	0.213 5444	0.325 9512	0.327 5090
6	120	4	52.9	27 8.84	32.8	1	45	7.1	0 16.92	0.213 9404	0.329 0525	0.330 5819
8	120	59	7.6	27 5.96	31.4	1	45	40.1	0 16.10	0.214 3271	0.332 0969	0.333 5974
10	121	53	16.7	27 3.14	30.0	1	46	11.5	0 15.29	0.214 7043	0.335 0837	0.336 5556
12	122	47	20.3	27 0.40	+ 28.6	+ 1	46	41.3	+ 0 14.48	0.215 0719	0.338 0133	0.339 4567
14	123	41	18.4	26 57.74	27.2	1	47	9.4	0 13.67	0.215 4300	0.340 8859	0.342 3012
16	124	35	11.3	26 55.16	25.7	1	47	35.9	0 12.85	0.215 7785	0.343 7023	0.345 0896
18	125	28	59.2	26 52.66	24.2	1	48	0.8	0 12.04	0.216 1174	0.346 4632	0.347 8231
20	126	22	42.1	26 50.24	22.7	1	48	24.1	0 11.23	0.216 4465	0.349 1697	0.350 5025
22	127	16	20.2	26 47.89	+ 21.2	+ 1	48	45.8	+ 0 10.42	0.216 7659	0.351 8220	0.353 1285
24	128	9	53.7	26 45.61	19.6	1	49	5.8	0 9.62	0.217 0755	0.354 4218	0.355 7019
26	129	3	22.7	26 43.41	18.0	1	49	24.2	0 8.81	0.217 3752	0.356 9689	0.358 2232
28	129	56	47.3	26 41.28	16.5	1	49	41.1	0 8.01	0.217 6651	0.359 4646	0.360 6931
30	130	50	7.8	26 39.22	14.9	1	49	56.3	0 7.20	0.217 9450	0.361 9087	0.363 1117
June 1	131	43	24.2	26 37.24	+ 13.3	+ 1	50	9.9	+ 0 6.40	0.218 2150	0.364 3022	0.365 4797
3	132	36	36.8	26 35.34	11.6	1	50	21.9	0 5.61	0.218 4751	0.366 6446	0.367 7964
5	133	29	45.6	26 33.51	10.0	1	50	32.3	0 4.81	0.218 7252	0.368 9355	0.370 0620
7	134	22	50.8	26 31.74	8.4	1	50	41.1	0 4.02	0.218 9652	0.371 1756	0.372 2762
9	135	15	52.6	26 30.06	6.8	1	50	48.4	0 3.22	0.219 1951	0.373 3640	0.374 4387
11	136	8	51.2	26 28.46	+ 5.1	+ 1	50	54.0	+ 0 2.43	0.219 4149	0.375 5007	0.376 5500
13	137	1	46.6	26 26.94	3.4	1	50	58.1	0 1.64	0.219 6246	0.377 5867	0.378 6108
15	137	54	39.0	26 25.48	1.8	1	51	0.6	0 0.85	0.219 8242	0.379 6225	0.380 6218
17	138	47	28.5	26 24.09	+ 0.1	1	51	1.5	+ 0 0.07	0.220 0136	0.381 6087	0.382 5833
19	139	40	15.4	26 22.78	- 1.5	1	51	0.8	- 0 0.71	0.220 1928	0.383 5457	0.384 4960
21	140	32	59.7	26 21.55	- 3.0	+ 1	50	58.6	- 0 1.49	0.220 3618	0.385 4343	0.386 3609
23	141	25	41.7	26 20.39	4.8	1	50	54.8	0 2.27	0.220 5205	0.387 2757	0.388 1785
25	142	18	21.4	26 19.31	6.4	1	50	49.5	0 3.05	0.220 6690	0.389 0695	0.389 9488
27	143	10	59.0	26 18.31	8.1	1	50	42.6	0 3.82	0.220 8072	0.390 8164	0.391 6725
29	144	3	34.7	26 17.39	9.7	1	50	34.2	0 4.60	0.220 9351	0.392 5170	0.393 3498
July 1	144	56	8.6	26 16.54	- 11.3	+ 1	50	24.2	- 0 5.38	0.221 0527	0.394 1709	0.394 9802
3	145	48	40.9	26 15.76	- 12.9	+ 1	50	12.7	- 0 6.15	0.221 1600	0.395 7778	0.396 5635

## MARS.

## GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.		
July	1	144 56 8.6	26 16.54	- 11.3	+ 1 50 24.2	- 0 5.38	0.221 0527	0.394 1709	0.394 9802	
	3	145 48 40.9	26 15.76	12.9	1 50 12.7	0 6.15	0.221 1600	0.395 7778	0.396 5635	
	5	146 41 11.6	26 15.04	14.5	1 49 59.6	0 6.92	0.221 2570	0.397 3374	0.398 0995	
	7	147 33 41.0	26 14.40	16.1	1 49 45.0	0 7.68	0.221 3437	0.398 8498	0.399 5883	
	9	148 26 9.2	26 13.83	17.6	1 49 28.9	0 8.44	0.221 4200	0.400 3149	0.401 0297	
	11	149 18 36.4	26 13.34	- 19.2	+ 1 49 11.2	- 0 9.20	0.221 4859	0.401 7328	0.402 4242	
	13	150 11 2.7	26 12.94	20.7	1 48 52.0	0 9.96	0.221 5415	0.403 1040	0.403 7722	
	15	151 3 28.2	26 12.61	22.2	1 48 31.3	0 10.72	0.221 5867	0.404 4287	0.405 0738	
	17	151 55 53.1	26 12.35	23.7	1 48 9.1	0 11.47	0.221 6215	0.405 7076	0.406 3302	
	19	152 48 17.6	26 12.16	25.1	1 47 45.5	0 12.21	0.221 6460	0.406 9415	0.407 5417	
	21	153 40 41.8	26 12.05	- 26.6	+ 1 47 20.3	- 0 12.97	0.221 6601	0.408 1307	0.408 7087	
	23	154 33 5.9	26 12.01	28.0	1 46 53.6	0 13.71	0.221 6638	0.409 2757	0.409 8318	
	25	155 25 29.9	26 12.04	29.4	1 46 25.4	0 14.45	0.221 6571	0.410 3768	0.410 9107	
	27	156 17 54.1	26 12.15	30.7	1 45 55.7	0 15.21	0.221 6400	0.411 4337	0.411 9459	
	29	157 10 18.6	26 12.34	32.1	1 45 24.6	0 15.94	0.221 6126	0.412 4473	0.412 9377	
	31	158 2 43.5	26 12.60	- 33.4	+ 1 44 52.0	- 0 16.68	0.221 5749	0.413 4171	0.413 8852	
	Aug.	2	158 55 9.1	26 12.94	34.6	1 44 17.9	0 17.41	0.221 5268	0.414 3421	0.414 7878
		4	159 47 35.4	26 13.36	35.9	1 43 42.3	0 18.13	0.221 4683	0.415 2223	0.415 6457
		6	160 40 2.5	26 13.85	37.1	1 43 5.3	0 18.86	0.221 3993	0.416 0580	0.416 4589
		8	161 32 30.7	26 14.40	38.3	1 42 26.9	0 19.60	0.221 3199	0.416 8486	0.417 2272
		10	162 25 0.1	26 15.03	- 39.4	+ 1 41 47.0	- 0 20.32	0.221 2302	0.417 5946	0.417 9510
		12	163 17 30.9	26 15.74	40.5	1 41 5.6	0 21.03	0.221 1303	0.418 2964	0.418 6307
		14	164 10 3.1	26 16.53	41.6	1 40 22.8	0 21.75	0.221 0201	0.418 9542	0.419 2670
		16	165 2 37.0	26 17.39	42.6	1 39 38.6	0 22.46	0.220 8995	0.419 5690	0.419 8602
		18	165 55 12.7	26 18.31	43.6	1 38 53.0	0 23.17	0.220 7687	0.420 1408	0.420 4107
		20	166 47 50.3	26 19.31	- 44.5	+ 1 38 6.0	- 0 23.88	0.220 6276	0.420 6701	0.420 9189
		22	167 40 30.0	26 20.38	45.4	1 37 17.5	0 24.58	0.220 4762	0.421 1571	0.421 3850
		24	168 33 11.9	26 21.53	46.3	1 36 27.6	0 25.28	0.220 3146	0.421 6023	0.421 8090
		26	169 25 56.2	26 22.77	47.1	1 35 36.4	0 25.98	0.220 1428	0.422 0052	0.422 1908
		28	170 18 43.1	26 24.09	47.9	1 34 43.7	0 26.66	0.219 9607	0.422 3657	0.422 5300
	30	171 11 32.7	26 25.48	- 48.6	+ 1 33 49.7	- 0 27.36	0.219 7685	0.422 6834	0.422 8261	
Sept.	1	172 4 25.0	26 26.93	49.3	1 32 54.2	0 28.06	0.219 5662	0.422 9579	0.423 0789	
	3	172 57 20.4	26 28.46	49.9	1 31 57.4	0 28.74	0.219 3537	0.423 1890	0.423 2883	
	5	173 50 18.9	26 30.06	50.5	1 30 59.3	0 29.42	0.219 1311	0.423 3768	0.423 4542	
	7	174 43 20.7	26 31.73	51.1	1 29 59.7	0 30.09	0.218 8984	0.423 5208	0.423 5768	
	9	175 36 26.0	26 33.48	- 51.6	+ 1 28 58.9	- 0 30.77	0.218 6557	0.423 6221	0.423 6566	
	11	176 29 34.8	26 35.32	52.0	1 27 56.7	0 31.44	0.218 4030	0.423 6805	0.423 6937	
	13	177 22 47.4	26 37.24	52.4	1 26 53.1	0 32.11	0.218 1403	0.423 6964	0.423 6885	
	15	178 16 3.8	26 39.24	52.8	1 25 48.2	0 32.77	0.217 8677	0.423 6701	0.423 6413	
	17	179 9 24.3	26 41.31	53.1	1 24 42.0	0 33.42	0.217 5851	0.423 6022	0.423 5528	
	19	180 2 49.0	26 43.44	- 53.3	+ 1 23 34.5	- 0 34.08	0.217 2926	0.423 4931	0.423 4230	
	21	180 56 18.1	26 45.64	53.5	1 22 25.7	0 34.74	0.216 9903	0.423 3427	0.423 2522	
23	181 49 51.6	26 47.92	53.6	1 21 15.5	0 35.38	0.216 6782	0.423 1514	0.423 0402		
25	182 43 29.8	26 50.28	53.7	1 20 4.1	0 36.02	0.216 3564	0.422 9185	0.422 7864		
27	183 37 12.8	26 52.71	53.8	1 18 51.5	0 36.65	0.216 0248	0.422 6438	0.422 4907		
29	184 31 0.7	26 55.22	- 53.8	+ 1 17 37.5	- 0 37.29	0.215 6836	0.422 3270	0.422 1525		
Oct.	1	185 24 53.7	26 57.81	- 53.7	+ 1 16 22.3	- 0 37.92	0.215 3327	0.421 9674	0.421 7716	

MARS.

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	°	'	"			°	'	"			At Date.	At Intermediate Date.	
Oct.	1	185	24	53.7	26 57.81	- 53.7	+ 1	16	22.3	- 0 37.92	0.215 3327	0.421 9674	0.421 7716
	3	186	18	52.0	27 0.47	53.6	1	15	5.8	0 38.54	0.214 9723	0.421 5652	0.421 3480
	5	187	12	55.7	27 3.21	53.4	1	13	48.1	0 39.16	0.214 6023	0.421 1202	0.420 8818
	7	188	7	4.9	27 6.02	53.2	1	12	29.2	0 39.77	0.214 2229	0.420 6329	0.420 3733
	9	189	1	19.8	27 8.91	52.9	1	11	9.0	0 40.38	0.213 8340	0.420 1031	0.419 8226
	11	189	55	40.6	27 11.87	- 52.6	+ 1	9	47.6	- 0 40.98	0.213 4358	0.419 5316	0.419 2302
	13	190	50	7.4	27 14.91	52.2	1	8	25.1	0 41.58	0.213 0283	0.418 9184	0.418 5964
	15	191	44	40.3	27 18.02	51.8	1	7	1.3	0 42.17	0.212 6115	0.418 2642	0.417 9218
	17	192	39	19.5	27 21.21	51.3	1	5	36.4	0 42.75	0.212 1855	0.417 5692	0.417 2066
	19	193	34	5.2	27 24.47	50.7	1	4	10.3	0 43.33	0.211 7504	0.416 8339	0.416 4512
	21	194	28	57.5	27 27.81	- 50.1	+ 1	2	43.0	- 0 43.91	0.211 3063	0.416 0584	0.415 6553
	23	195	23	56.5	27 31.23	49.5	1	1	14.6	0 44.48	0.210 8532	0.415 2420	0.414 8186
	25	196	19	2.5	27 34.73	48.8	0	59	45.1	0 45.05	0.210 3912	0.414 3850	0.413 9410
	27	197	14	15.5	27 38.31	48.0	0	58	14.4	0 45.60	0.209 9203	0.413 4865	0.413 0216
	29	198	9	35.8	27 41.95	47.2	0	56	42.7	0 46.14	0.209 4407	0.412 5463	0.412 0605
Nov.	31	199	5	3.4	27 45.66	- 46.4	+ 0	55	9.9	- 0 46.68	0.208 9524	0.411 5642	0.411 0575
	2	200	0	38.5	27 49.45	45.5	0	53	36.0	0 47.22	0.208 4554	0.410 5404	0.410 0128
	4	200	56	21.3	27 53.32	44.5	0	52	1.0	0 47.74	0.207 9499	0.409 4749	0.408 9265
	6	201	52	11.9	27 57.27	43.5	0	50	25.0	0 48.27	0.207 4360	0.408 3679	0.407 7989
	8	202	48	10.4	28 1.29	42.5	0	48	47.9	0 48.78	0.206 9138	0.407 2197	0.406 6304
	10	203	44	17.0	28 5.38	- 41.4	+ 0	47	9.8	- 0 49.27	0.206 3833	0.406 0311	0.405 4216
	12	204	40	31.9	28 9.54	40.2	0	45	30.8	0 49.77	0.205 8446	0.404 8021	0.404 1727
	14	205	36	55.2	28 13.77	39.0	0	43	50.7	0 50.26	0.205 2979	0.403 5335	0.402 8845
	16	206	33	27.0	28 18.09	37.8	0	42	9.7	0 50.74	0.204 7432	0.402 2258	0.401 5573
	18	207	30	7.6	28 22.49	36.5	0	40	27.8	0 51.20	0.204 1806	0.400 8791	0.400 1912
	20	208	26	57.0	28 26.96	- 35.2	+ 0	38	44.9	- 0 51.67	0.203 6103	0.399 4935	0.398 7859
	22	209	23	55.4	28 31.48	33.8	0	37	1.1	0 52.12	0.203 0323	0.398 0684	0.397 3409
	24	210	21	2.9	28 36.06	32.4	0	35	16.4	0 52.55	0.202 4468	0.396 6034	0.395 8560
	26	211	18	19.7	28 40.72	31.0	0	33	30.9	0 52.99	0.201 8538	0.395 0987	0.394 3314
	28	212	15	45.9	28 45.46	29.5	0	31	44.5	0 53.41	0.201 2535	0.393 5541	0.392 7667
Dec.	30	213	13	21.6	28 50.29	- 27.9	+ 0	29	57.2	- 0 53.81	0.200 6461	0.391 9692	0.391 1618
	2	214	11	7.1	28 55.19	26.4	0	28	9.2	0 54.21	0.200 0316	0.390 3445	0.389 5173
	4	215	9	2.4	29 0.14	24.8	0	26	20.4	0 54.60	0.199 4102	0.388 6802	0.387 8334
	6	216	7	7.7	29 5.16	23.2	0	24	30.8	0 54.98	0.198 7819	0.386 9768	0.386 1103
	8	217	5	23.1	29 10.25	21.5	0	22	40.5	0 55.34	0.198 1470	0.385 2342	0.384 3486
	10	218	3	48.8	29 15.41	- 19.8	+ 0	20	49.4	- 0 55.69	0.197 5055	0.383 4537	0.382 5495
	12	219	2	24.8	29 20.65	18.1	0	18	57.6	0 56.03	0.196 8576	0.381 6360	0.380 7133
	14	220	1	11.4	29 25.96	16.4	0	17	5.2	0 56.36	0.196 2035	0.379 7814	0.378 8405
	16	221	0	8.7	29 31.33	14.6	0	15	12.2	0 56.68	0.195 5433	0.377 8906	0.376 9317
	18	221	59	16.8	29 36.76	12.8	0	13	18.5	0 56.98	0.194 8772	0.375 9638	0.374 9866
	20	222	58	35.8	29 42.25	- 11.0	+ 0	11	24.3	- 0 57.26	0.194 2053	0.374 0003	0.373 0050
	22	223	58	5.9	29 47.81	9.2	0	9	29.5	0 57.54	0.193 5277	0.372 0005	0.370 9868
	24	224	57	47.2	29 53.44	7.3	0	7	34.1	0 57.80	0.192 8447	0.369 9638	0.368 9317
	26	225	57	39.7	29 59.12	5.5	0	5	38.2	0 58.04	0.192 1564	0.367 8904	0.366 8399
	28	226	57	43.7	30 4.86	3.6	0	3	41.9	0 58.27	0.191 4629	0.365 7803	0.364 7114
30	227	57	59.3	30 10.66	- 1.7	+ 0	1	45.2	- 0 58.48	0.190 7645	0.363 6335	0.362 5466	
32	228	58	26.5	30 16.55	+ 0.2	- 0	0	12.0	- 0 58.68	0.190 0614	0.361 4508	0.360 3461	

JUPITER.								
GREENWICH MEAN NOON.								
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	° ' "	"	"	° ' "	"		At Date.	At Intermediate Date.
Jan. 2	183 1 6.7	4 32.55	+ 6.0	+ 1 18 2.5	+ 0.70	0.736 3649	0.732 1845	0.729 5819
6	183 19 16.9	4 32.52	5.7	1 18 5.2	0.67	0.736 3841	0.726 9623	0.724 3287
10	183 37 26.9	4 32.50	5.4	1 18 7.8	0.63	0.736 4027	0.721 6841	0.719 0317
14	183 55 36.9	4 32.48	5.1	1 18 10.3	0.60	0.736 4208	0.716 3746	0.713 7159
18	184 13 46.7	4 32.46	4.9	1 18 12.7	0.57	0.736 4383	0.711 0590	0.708 4072
22	184 31 56.5	4 32.44	+ 4.6	+ 1 18 14.9	+ 0.53	0.736 4551	0.705 7640	0.703 1328
26	184 50 6.2	4 32.42	4.3	1 18 17.0	0.50	0.736 4713	0.700 5170	0.697 9201
30	185 8 15.9	4 32.40	4.0	1 18 19.0	0.47	0.736 4869	0.695 3457	0.692 7976
Feb. 3	185 26 25.4	4 32.38	3.7	1 18 20.8	0.44	0.736 5019	0.690 2799	0.687 7968
7	185 44 34.9	4 32.36	3.5	1 18 22.5	0.41	0.736 5164	0.685 3528	0.682 9524
11	186 2 44.3	4 32.34	+ 3.2	+ 1 18 24.1	+ 0.37	0.736 5302	0.680 6000	0.678 3000
15	186 20 53.6	4 32.32	2.9	1 18 25.6	0.34	0.736 5434	0.676 0569	0.673 8750
19	186 39 2.9	4 32.30	2.6	1 18 26.9	0.30	0.736 5560	0.671 7584	0.669 7111
23	186 57 12.1	4 32.29	2.4	1 18 28.1	0.27	0.736 5680	0.667 7371	0.665 8403
27	187 15 21.3	4 32.28	2.2	1 18 29.1	0.24	0.736 5793	0.664 0245	0.662 2937
Mar. 3	187 33 30.4	4 32.26	+ 1.9	+ 1 18 30.0	+ 0.21	0.736 5900	0.660 6518	0.659 1027
7	187 51 39.5	4 32.25	1.6	1 18 30.8	0.18	0.736 6001	0.657 6502	0.656 2080
11	188 9 48.5	4 32.24	1.3	1 18 31.5	0.15	0.736 6096	0.655 0496	0.653 9080
15	188 27 57.4	4 32.23	1.0	1 18 32.0	0.12	0.736 6185	0.652 8758	0.651 9553
19	188 46 6.3	4 32.22	0.7	1 18 32.4	0.08	0.736 6269	0.651 1486	0.650 4574
23	189 4 15.2	4 32.21	+ 0.4	+ 1 18 32.6	+ 0.05	0.736 6346	0.649 8829	0.649 4263
27	189 22 24.1	4 32.20	+ 0.1	1 18 32.7	+ 0.02	0.736 6417	0.649 0885	0.648 8702
31	189 40 32.9	4 32.19	- 0.2	1 18 32.7	- 0.01	0.736 6482	0.648 7719	0.648 7937
Apr. 4	189 58 41.7	4 32.18	0.5	1 18 32.6	0.04	0.736 6541	0.648 9355	0.649 1970
8	190 16 50.4	4 32.18	0.7	1 18 32.4	0.08	0.736 6593	0.649 5777	0.650 0765
12	190 34 59.1	4 32.17	- 1.0	+ 1 18 31.9	- 0.11	0.736 6639	0.650 6918	0.651 4216
16	190 53 7.8	4 32.17	1.3	1 18 31.4	0.14	0.736 6679	0.652 2634	0.653 2146
20	191 11 16.5	4 32.16	1.6	1 18 30.7	0.17	0.736 6713	0.654 2723	0.655 4337
24	191 29 25.1	4 32.16	1.9	1 18 30.0	0.21	0.736 6741	0.656 6957	0.658 0553
28	191 47 33.8	4 32.16	2.1	1 18 29.1	0.25	0.736 6764	0.659 5091	0.661 0536
May 2	192 5 42.4	4 32.16	- 2.4	+ 1 18 28.0	- 0.28	0.736 6780	0.662 6856	0.664 4014
6	192 23 51.1	4 32.15	2.7	1 18 26.8	0.31	0.736 6790	0.666 1973	0.668 0695
10	192 41 59.7	4 32.15	3.0	1 18 25.5	0.34	0.736 6794	0.670 0143	0.672 0273
14	193 0 8.3	4 32.16	3.3	1 18 24.0	0.38	0.736 6792	0.674 1037	0.676 2389
18	193 18 17.0	4 32.16	3.5	1 18 22.5	0.41	0.736 6783	0.678 4289	0.680 6697
22	193 36 25.6	4 32.17	- 3.8	+ 1 18 20.8	- 0.44	0.736 6768	0.682 9574	0.685 2880
26	193 54 34.2	4 32.17	4.1	1 18 18.9	0.47	0.736 6747	0.687 6577	0.690 0628
30	194 12 42.9	4 32.17	4.3	1 18 17.0	0.50	0.736 6720	0.692 4997	0.694 9649
June 3	194 30 51.5	4 32.17	4.6	1 18 14.9	0.53	0.736 6687	0.697 4548	0.699 9661
7	194 49 0.2	4 32.17	4.9	1 18 12.6	0.57	0.736 6648	0.702 4951	0.705 0383
11	195 7 8.9	4 32.18	- 5.2	+ 1 18 10.3	- 0.60	0.736 6602	0.707 5920	0.710 1528
15	195 25 17.6	4 32.18	5.5	1 18 7.8	0.64	0.736 6550	0.712 7175	0.715 2832
19	195 43 26.4	4 32.19	5.8	1 18 5.2	0.67	0.736 6492	0.717 8472	0.720 4069
23	196 1 35.2	4 32.20	6.1	1 18 2.4	0.70	0.736 6429	0.722 9598	0.725 5034
27	196 19 44.0	4 32.21	6.3	1 17 59.5	0.74	0.736 6360	0.728 0355	0.730 5540
July 1	196 37 52.8	4 32.22	- 6.6	+ 1 17 56.5	- 0.77	0.736 6284	0.733 0569	0.735 5420
5	196 56 1.7	4 32.23	- 6.9	+ 1 17 53.4	- 0.80	0.736 6202	0.738 0071	0.740 4501

## JUPITER.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
July	1 196 37 52.8	4 32.22	- 6.6	+ 1 17 56.5	- 0.77	0.736 6284	0.733 0569	0.735 5420
	5 196 56 1.7	4 32.23	6.9	1 17 53.4	0.80	0.736 6202	0.738 0071	0.740 4501
	9 197 14 10.7	4 32.24	7.2	1 17 50.1	0.84	0.736 6114	0.742 8687	0.745 2608
	13 197 32 19.7	4 32.25	7.5	1 17 46.7	0.87	0.736 6020	0.747 6248	0.749 9591
	17 197 50 28.7	4 32.26	7.7	1 17 43.2	0.90	0.736 5921	0.752 2624	0.754 5332
	21 198 8 37.7	4 32.27	- 8.0	+ 1 17 39.5	- 0.93	0.736 5815	0.756 7702	0.758 9722
	25 198 26 46.9	4 32.28	8.3	1 17 35.7	0.96	0.736 5703	0.761 1381	0.763 2670
	29 198 44 56.1	4 32.29	8.5	1 17 31.8	0.99	0.736 5585	0.765 3578	0.767 4094
	Aug. 2 199 3 5.3	4 32.31	8.8	1 17 27.7	1.02	0.736 5460	0.769 4205	0.771 3899
	6 199 21 14.6	4 32.33	9.0	1 17 23.5	1.06	0.736 5329	0.773 3165	0.775 1993
	10 199 39 23.9	4 32.34	- 9.3	+ 1 17 19.2	- 1.09	0.736 5193	0.777 0373	0.778 8297
	14 199 57 33.4	4 32.36	9.6	1 17 14.8	1.13	0.736 5051	0.780 5758	0.782 2750
	18 200 15 42.9	4 32.38	9.8	1 17 10.2	1.16	0.736 4903	0.783 9268	0.785 5306
	22 200 33 52.5	4 32.40	10.1	1 17 5.5	1.19	0.736 4748	0.787 0860	0.788 5927
	26 200 52 2.1	4 32.42	10.3	1 17 0.7	1.23	0.736 4587	0.790 0561	0.791 4576
	30 201 10 11.8	4 32.44	- 10.6	+ 1 16 55.7	- 1.26	0.736 4421	0.792 8144	0.794 1198
	Sept. 3 201 28 21.7	4 32.46	10.9	1 16 50.6	1.29	0.736 4249	0.795 3731	0.796 5736
	7 201 46 31.6	4 32.48	11.1	1 16 45.4	1.32	0.736 4070	0.797 7212	0.798 8154
	11 202 4 41.6	4 32.51	11.4	1 16 40.0	1.35	0.736 3885	0.799 8559	0.800 8423
	15 202 22 51.7	4 32.54	11.6	1 16 34.6	1.39	0.736 3694	0.801 7744	0.802 6521
	19 202 41 1.9	4 32.56	- 11.9	+ 1 16 29.0	- 1.42	0.736 3498	0.803 4753	0.804 2439
	23 202 59 12.2	4 32.58	12.2	1 16 23.2	1.45	0.736 3296	0.804 9574	0.805 6157
	27 203 17 22.6	4 32.60	12.4	1 16 17.4	1.48	0.736 3087	0.806 2181	0.806 7641
	Oct. 1 203 35 33.1	4 32.62	12.7	1 16 11.4	1.51	0.736 2872	0.807 2534	0.807 6857
	5 203 53 43.7	4 32.65	12.9	1 16 5.3	1.55	0.736 2651	0.808 0609	0.808 3787
	9 204 11 54.4	4 32.68	- 13.2	+ 1 15 59.0	- 1.58	0.736 2424	0.808 6389	0.808 8414
	13 204 30 5.2	4 32.71	13.4	1 15 52.6	1.61	0.736 2191	0.808 9862	0.809 0734
	17 204 48 16.2	4 32.74	13.7	1 15 46.1	1.64	0.736 1952	0.809 1031	0.809 0753
	21 205 6 27.3	4 32.78	13.9	1 15 39.5	1.67	0.736 1707	0.808 9899	0.808 8466
	25 205 24 38.5	4 32.82	14.1	1 15 32.7	1.70	0.736 1456	0.808 6452	0.808 3855
	29 205 42 49.7	4 32.85	- 14.4	+ 1 15 25.9	- 1.74	0.736 1199	0.808 0672	0.807 6900
	Nov. 2 206 1 1.2	4 32.88	14.6	1 15 18.8	1.77	0.736 0936	0.807 2539	0.806 7591
	6 206 19 12.8	4 32.91	14.9	1 15 11.7	1.80	0.736 0667	0.806 2057	0.805 5937
	10 206 37 24.5	4 32.94	15.1	1 15 4.4	1.83	0.736 0392	0.804 9234	0.804 1949
	14 206 55 36.4	4 32.98	15.3	1 14 57.0	1.87	0.736 0112	0.803 4086	0.802 5647
	18 207 13 48.4	4 33.01	- 15.6	+ 1 14 49.5	- 1.90	0.735 9825	0.801 6632	0.800 7044
	22 207 32 0.5	4 33.05	15.8	1 14 41.9	1.93	0.735 9532	0.799 6883	0.798 6148
	26 207 50 12.8	4 33.09	16.1	1 14 34.1	1.96	0.735 9233	0.797 4837	0.796 2953
	30 208 8 25.3	4 33.13	16.3	1 14 26.2	1.99	0.735 8929	0.795 0499	0.793 7480
	Dec. 4 208 26 37.9	4 33.17	16.5	1 14 18.2	2.02	0.735 8619	0.792 3899	0.790 9761
	8 208 44 50.6	4 33.21	- 16.7	+ 1 14 10.0	- 2.05	0.735 8303	0.789 5073	0.787 9842
	12 209 3 3.5	4 33.25	16.9	1 14 1.7	2.08	0.735 7981	0.786 4073	0.784 7772
	16 209 21 16.6	4 33.29	17.1	1 13 53.3	2.11	0.735 7653	0.783 0945	0.781 3600
	20 209 39 29.8	4 33.33	17.3	1 13 44.8	2.14	0.735 7319	0.779 5740	0.777 7369
	24 209 57 43.2	4 33.37	17.5	1 13 36.1	2.18	0.735 6978	0.775 8494	0.773 9122
	28 210 15 56.8	4 33.41	- 17.7	+ 1 13 27.3	- 2.21	0.735 6632	0.771 9260	0.769 8921
	32 210 34 10.6	4 33.46	- 17.9	+ 1 13 18.4	- 2.24	0.735 6280	0.767 8116	0.765 6854

SATURN.								
GREENWICH MEAN NOON.								
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Interme- diate Date.
Jan. 2	22 34 56.6	2 6.00	+ 0 0.9	- 2 29 28.9	- 0.03	0.969 6106	0.962 9292	0.964 4911
6	22 43 20.6	2 6.03	0 0.5	2 29 29.0	- 0.02	0.969 5569	0.966 0507	0.967 6061
10	22 51 44.8	2 6.06	+ 0 0.1	2 29 29.1	0.00	0.969 5033	0.969 1555	0.970 6973
14	23 0 9.1	2 6.10	- 0 0.4	2 29 29.1	+ 0.01	0.969 4498	0.972 2295	0.973 7502
18	23 8 33.6	2 6.13	0 0.9	2 29 29.0	0.02	0.969 3964	0.975 2577	0.976 7506
22	23 16 58.2	2 6.16	- 0 1.4	- 2 29 28.9	+ 0.03	0.969 3432	0.978 2273	0.979 6864
26	23 25 22.9	2 6.19	0 1.9	2 29 28.7	0.05	0.969 2900	0.981 1267	0.982 5469
30	23 33 47.7	2 6.22	0 2.4	2 29 28.5	0.06	0.969 2368	0.983 9458	0.985 3222
Feb. 3	23 42 12.7	2 6.25	0 2.9	2 29 28.2	0.07	0.969 1837	0.986 6749	0.988 0027
7	23 50 37.8	2 6.28	0 3.4	2 29 27.9	0.09	0.969 1306	0.989 3044	0.990 5788
11	23 59 2.9	2 6.30	- 0 3.9	- 2 29 27.5	+ 0.10	0.969 0775	0.991 8247	0.993 0411
15	24 7 28.1	2 6.33	0 4.3	2 29 27.1	0.11	0.969 0244	0.994 2270	0.995 3815
19	24 15 53.5	2 6.36	0 4.8	2 29 26.6	0.13	0.968 9714	0.996 5038	0.997 5932
23	24 24 19.1	2 6.39	0 5.3	2 29 26.1	0.14	0.968 9185	0.998 6492	0.999 6712
27	24 32 44.7	2 6.43	0 5.8	2 29 25.5	0.15	0.968 8657	1.000 6586	1.001 6107
Mar. 3	24 41 10.5	2 6.46	- 0 6.3	- 2 29 24.9	+ 0.17	0.968 8130	1.002 5268	1.003 4065
7	24 49 36.4	2 6.49	0 6.7	2 29 24.2	0.18	0.968 7604	1.004 2491	1.005 0538
11	24 58 2.4	2 6.52	0 7.2	2 29 23.4	0.19	0.968 7077	1.005 8202	1.006 5478
15	25 6 28.6	2 6.55	0 7.7	2 29 22.6	0.21	0.968 6550	1.007 2361	1.007 8847
19	25 14 54.8	2 6.58	0 8.1	2 29 21.7	0.22	0.968 6024	1.008 4935	1.009 0623
23	25 23 21.2	2 6.61	- 0 8.5	- 2 29 20.8	+ 0.24	0.968 5498	1.009 5909	1.010 0792
27	25 31 47.7	2 6.64	0 9.0	2 29 19.8	0.25	0.968 4972	1.010 5269	1.010 9339
31	25 40 14.4	2 6.67	0 9.5	2 29 18.8	0.26	0.968 4447	1.011 3002	1.011 6255
Apr. 4	25 48 41.1	2 6.70	0 10.0	2 29 17.8	0.28	0.968 3923	1.011 9095	1.012 1519
8	25 57 8.0	2 6.73	0 10.5	2 29 16.6	0.29	0.968 3400	1.012 3526	1.012 5116
12	26 5 35.0	2 6.76	- 0 11.0	- 2 29 15.4	+ 0.30	0.968 2877	1.012 6288	1.012 7041
16	26 14 2.1	2 6.79	0 11.4	2 29 14.2	0.32	0.968 2355	1.012 7377	1.012 7297
20	26 22 29.3	2 6.82	0 11.9	2 29 12.9	0.33	0.968 1834	1.012 6804	1.012 5898
24	26 30 56.7	2 6.85	0 12.4	2 29 11.6	0.35	0.968 1313	1.012 4582	1.012 2857
28	26 39 24.1	2 6.88	0 12.9	2 29 10.2	0.36	0.968 0793	1.012 0724	1.011 8182
May 2	26 47 51.7	2 6.91	- 0 13.4	- 2 29 8.7	+ 0.37	0.968 0273	1.011 5233	1.011 1878
6	26 56 19.4	2 6.94	0 13.8	2 29 7.2	0.39	0.967 9753	1.010 8119	1.010 3958
10	27 4 47.3	2 6.97	0 14.3	2 29 5.6	0.40	0.967 9234	1.009 9397	1.009 4438
14	27 13 15.2	2 7.00	0 14.8	2 29 4.0	0.41	0.967 8716	1.008 9085	1.008 3342
18	27 21 43.3	2 7.03	0 15.3	2 29 2.3	0.43	0.967 8198	1.007 7215	1.007 0709
22	27 30 11.5	2 7.06	- 0 15.8	- 2 29 0.6	+ 0.44	0.967 7681	1.006 3827	1.005 6573
26	27 38 39.8	2 7.09	0 16.2	2 28 58.8	0.45	0.967 7165	1.004 8950	1.004 0964
30	27 47 8.2	2 7.12	0 16.7	2 28 57.0	0.46	0.967 6649	1.003 2617	1.002 3912
June 3	27 55 36.8	2 7.15	0 17.1	2 28 55.1	0.48	0.967 6134	1.001 4854	1.000 5448
7	28 4 5.5	2 7.18	0 17.6	2 28 53.1	0.49	0.967 5619	0.999 5699	0.998 5615
11	28 12 34.3	2 7.21	- 0 18.1	- 2 28 51.1	+ 0.51	0.967 5104	0.997 5204	0.996 4474
15	28 21 3.2	2 7.24	0 18.5	2 28 49.1	0.52	0.967 4590	0.995 3431	0.994 2081
19	28 29 32.2	2 7.27	0 19.0	2 28 47.0	0.53	0.967 4077	0.993 0432	0.991 8493
23	28 38 1.4	2 7.30	0 19.5	2 28 44.8	0.55	0.967 3564	0.990 6273	0.989 3779
27	28 46 30.7	2 7.33	0 20.0	2 28 42.6	0.56	0.967 3052	0.988 1018	0.986 7997
July 1	28 55 0.1	2 7.36	- 0 20.5	- 2 28 40.3	+ 0.58	0.967 2541	0.985 4724	0.984 1208
5	29 3 29.6	2 7.39	- 0 20.9	- 2 28 38.0	+ 0.59	0.967 2030	0.982 7460	0.981 3492

## SATURN.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
	°	'	"			°	'	"			At Date.	At Intermediate Date.
July	1	28	55 0.1	2 7.36	— 0 20.5	— 2	28	40.3	+ 0.58	0.967 2541	0.985 4724	0.984 1208
	5	29	3 29.6	2 7.39	0 20.9	2	28	38.0	0.59	0.967 2030	0.982 7460	0.981 3492
	9	29	11 59.2	2 7.42	0 21.4	2	28	35.6	0.60	0.967 1520	0.979 9316	0.978 4944
	13	29	20 29.0	2 7.45	0 21.8	2	28	33.1	0.62	0.967 1011	0.977 0387	0.975 5658
	17	29	28 58.8	2 7.48	0 22.3	2	28	30.6	0.63	0.967 0502	0.974 0770	0.972 5737
	21	29	37 28.8	2 7.51	— 0 22.8	— 2	28	28.1	+ 0.64	0.966 9994	0.971 0573	0.969 5290
	25	29	45 58.9	2 7.54	0 23.2	2	28	25.5	0.66	0.966 9486	0.967 9898	0.966 4411
	29	29	54 29.1	2 7.57	0 23.7	2	28	22.8	0.67	0.966 8979	0.964 8844	0.963 3211
Aug.	2	30	2 59.5	2 7.60	0 24.2	2	28	20.1	0.69	0.966 8472	0.961 7530	0.960 1816
	6	30	11 29.9	2 7.63	0 24.7	2	28	17.3	0.70	0.966 7966	0.958 6087	0.957 0362
	10	30	20 0.5	2 7.66	— 0 25.2	— 2	28	14.5	+ 0.71	0.966 7460	0.955 4660	0.953 8999
	14	30	28 31.2	2 7.69	0 25.6	2	28	11.6	0.73	0.966 6955	0.952 3399	0.950 7878
	18	30	37 2.0	2 7.72	0 26.1	2	28	8.7	0.74	0.966 6451	0.949 2453	0.947 7142
	22	30	45 33.0	2 7.75	0 26.5	2	28	5.7	0.76	0.966 5948	0.946 1963	0.944 6936
	26	30	54 4.0	2 7.77	0 27.0	2	28	2.6	0.77	0.966 5446	0.943 2079	0.941 7411
	30	31	2 35.2	2 7.80	— 0 27.5	— 2	27	59.5	+ 0.78	0.966 4944	0.940 2955	0.938 8732
Sept.	3	31	11 6.5	2 7.83	0 27.9	2	27	56.3	0.80	0.966 4443	0.937 4765	0.936 1076
	7	31	19 37.9	2 7.86	0 28.4	2	27	53.1	0.81	0.966 3943	0.934 7688	0.933 4622
	11	31	28 9.4	2 7.89	0 28.8	2	27	49.9	0.82	0.966 3443	0.932 1896	0.930 9531
	15	31	36 41.0	2 7.92	0 29.3	2	27	46.5	0.84	0.966 2943	0.929 7547	0.928 5964
	19	31	45 12.7	2 7.95	— 0 29.8	— 2	27	43.1	+ 0.85	0.966 2444	0.927 4800	0.926 4071
	23	31	53 44.6	2 7.98	0 30.2	2	27	39.7	0.86	0.966 1945	0.925 3796	0.924 3995
	27	32	2 16.6	2 8.01	0 30.7	2	27	36.2	0.87	0.966 1447	0.923 4687	0.922 5891
	Oct. 1	32	10 48.7	2 8.04	0 31.2	2	27	32.7	0.89	0.966 0950	0.921 7625	0.920 9906
Oct.	5	32	19 20.9	2 8.06	0 31.6	2	27	29.1	0.90	0.966 0454	0.920 2750	0.919 6172
	9	32	27 53.2	2 8.09	— 0 32.1	— 2	27	25.4	+ 0.91	0.965 9959	0.919 0184	0.918 4798
	13	32	36 25.6	2 8.12	0 32.5	2	27	21.7	0.93	0.965 9465	0.918 0024	0.917 5870
	17	32	44 58.2	2 8.15	0 33.0	2	27	18.0	0.94	0.965 8972	0.917 2344	0.916 9453
	21	32	53 30.8	2 8.18	0 33.5	2	27	14.1	0.96	0.965 8479	0.916 7203	0.916 5599
	25	33	2 3.6	2 8.20	0 33.9	2	27	10.2	0.97	0.965 7986	0.916 4646	0.916 4349
	29	33	10 36.5	2 8.23	— 0 34.4	— 2	27	6.3	+ 0.98	0.965 7494	0.916 4711	0.916 5732
	Nov. 2	33	19 9.5	2 8.26	0 34.8	2	27	2.3	1.00	0.965 7002	0.916 7411	0.916 9747
Nov.	6	33	27 42.6	2 8.29	0 35.3	2	26	58.3	1.02	0.965 6511	0.917 2735	0.917 6368
	10	33	36 15.9	2 8.32	0 35.7	2	26	54.2	1.03	0.965 6021	0.918 0637	0.918 5533
	14	33	44 49.2	2 8.35	0 36.2	2	26	50.0	1.04	0.965 5532	0.919 1047	0.919 7169
	18	33	53 22.7	2 8.38	— 0 36.6	— 2	26	45.8	+ 1.06	0.965 5044	0.920 3885	0.921 1181
	22	34	1 56.3	2 8.41	0 37.0	2	26	41.6	1.07	0.965 4557	0.921 9046	0.922 7467
	26	34	10 30.0	2 8.44	0 37.5	2	26	37.3	1.09	0.965 4070	0.923 6430	0.924 5920
	30	34	19 3.8	2 8.47	0 38.0	2	26	32.9	1.10	0.965 3584	0.925 5919	0.926 6408
	Dec. 4	34	27 37.7	2 8.49	0 38.4	2	26	28.5	1.11	0.965 3099	0.927 7366	0.928 8772
Dec.	8	34	36 11.7	2 8.52	— 0 38.9	— 2	26	24.0	+ 1.13	0.965 2614	0.930 0605	0.931 2844
	12	34	44 45.9	2 8.55	0 39.3	2	26	19.4	1.14	0.965 2130	0.932 5466	0.933 8450
	16	34	53 20.1	2 8.58	0 39.8	2	26	14.8	1.16	0.965 1646	0.935 1773	0.936 5414
	20	35	1 54.5	2 8.61	0 40.2	2	26	10.2	1.17	0.965 1163	0.937 9353	0.939 3569
	24	35	10 29.0	2 8.63	0 40.7	2	26	5.5	1.19	0.965 0680	0.940 8040	0.942 2743
	28	35	19 3.6	2 8.66	— 0 41.1	— 2	26	0.7	+ 1.20	0.965 0198	0.943 7658	0.945 2763
	32	35	27 38.3	2 8.69	— 0 41.5	— 2	25	55.9	+ 1.21	0.964 9718	0.946 8034	0.948 3446

URANUS.								
GREENWICH MEAN NOON.								
Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Interme- diate Date.
Jan. 6	291 6 1.3	40.42	+ 9.1	— 0 28 13.2	— 0.43	1.293 0203	1.314 1424	1.314 2500
14	291 11 24.6	40.42	9.1	0 28 16.6	0.43	1.293 0490	1.314 2613	1.314 1763
22	291 16 47.9	40.41	9.1	0 28 20.0	0.43	1.293 0777	1.313 9958	1.313 7214
30	291 22 11.1	40.40	9.1	0 28 23.5	0.43	1.293 1064	1.313 3541	1.312 8950
Feb. 7	291 27 34.3	40.40	9.1	0 28 26.9	0.43	1.293 1350	1.312 3456	1.311 7080
15	291 32 57.4	40.39	+ 9.1	— 0 28 30.4	— 0.43	1.293 1636	1.310 9850	1.310 1797
23	291 38 20.6	40.39	9.1	0 28 33.8	0.43	1.293 1922	1.309 2954	1.308 3359
Mar. 3	291 43 43.7	40.38	9.1	0 28 37.2	0.43	1.293 2207	1.307 3048	1.306 2059
11	291 49 6.7	40.38	9.1	0 28 40.6	0.43	1.293 2492	1.305 0435	1.303 8226
19	291 54 29.7	40.37	9.1	0 28 44.0	0.43	1.293 2777	1.302 5488	1.301 2278
27	291 59 52.7	40.37	+ 9.1	— 0 28 47.4	— 0.43	1.293 3062	1.299 8649	1.298 4656
Apr. 4	292 5 15.6	40.36	9.1	0 28 50.9	0.43	1.293 3346	1.297 0357	1.295 5812
12	292 10 38.5	40.36	9.1	0 28 54.3	0.43	1.293 3630	1.294 1088	1.292 6259
20	292 16 1.4	40.35	9.1	0 28 57.7	0.43	1.293 3914	1.291 1391	1.289 6553
28	292 21 24.2	40.35	9.1	0 29 1.1	0.42	1.293 4198	1.288 1814	1.286 7237
May 6	292 26 47.0	40.35	+ 9.2	— 0 29 4.5	— 0.42	1.293 4481	1.285 2890	1.283 8849
14	292 32 9.8	40.34	9.2	0 29 7.8	0.42	1.293 4764	1.282 5191	1.281 1983
22	292 37 32.5	40.34	9.2	0 29 11.2	0.42	1.293 5047	1.279 9288	1.278 7173
30	292 42 55.2	40.33	9.2	0 29 14.6	0.42	1.293 5330	1.277 5697	1.276 4918
June 7	292 48 17.9	40.33	9.2	0 29 17.9	0.42	1.293 5612	1.275 4901	1.274 5705
15	292 53 40.5	40.33	+ 9.2	— 0 29 21.3	— 0.42	1.293 5894	1.273 7383	1.272 9979
23	292 59 3.1	40.32	9.2	0 29 24.7	0.42	1.293 6176	1.272 3529	1.271 8066
July 1	293 4 25.6	40.32	9.2	0 29 28.0	0.42	1.293 6458	1.271 3631	1.271 0244
9	293 9 48.1	40.32	9.2	0 29 31.4	0.42	1.293 6739	1.270 7936	1.270 6725
17	293 15 10.6	40.31	9.2	0 29 34.7	0.42	1.293 7020	1.270 6607	1.270 7580
25	293 20 33.0	40.31	+ 9.2	— 0 29 38.1	— 0.42	1.293 7301	1.270 9643	1.271 2791
Aug. 2	293 25 55.4	40.30	9.2	0 29 41.4	0.42	1.293 7581	1.271 7012	1.272 2280
10	293 31 17.8	40.29	9.2	0 29 44.7	0.42	1.293 7861	1.272 8563	1.273 5826
18	293 36 40.1	40.29	9.2	0 29 48.1	0.41	1.293 8141	1.274 4032	1.275 3135
26	293 42 2.4	40.28	9.2	0 29 51.4	0.41	1.293 8421	1.276 3087	1.277 3839
Sept. 3	293 47 24.6	40.28	+ 9.3	— 0 29 54.7	— 0.41	1.293 8700	1.278 5337	1.279 7519
11	293 52 46.9	40.27	9.3	0 29 58.0	0.41	1.293 8979	1.281 0316	1.282 3659
19	293 58 9.0	40.27	9.3	0 30 1.3	0.41	1.293 9258	1.283 7480	1.285 1713
27	294 3 31.2	40.26	9.3	0 30 4.6	0.41	1.293 9537	1.286 6291	1.288 1144
Oct. 5	294 8 53.3	40.26	9.3	0 30 7.9	0.41	1.293 9815	1.289 6200	1.291 1383
13	294 14 15.4	40.26	+ 9.3	— 0 30 11.2	— 0.41	1.294 0093	1.292 6615	1.294 1827
21	294 19 37.4	40.25	9.3	0 30 14.5	0.41	1.294 0371	1.295 6952	1.297 1926
29	294 24 59.4	40.25	9.3	0 30 17.8	0.41	1.294 0648	1.298 6682	1.300 1154
Nov. 6	294 30 21.4	40.24	9.3	0 30 21.1	0.41	1.294 0925	1.301 5276	1.302 8984
14	294 35 43.3	40.24	9.3	0 30 24.3	0.41	1.294 1202	1.304 2219	1.305 4931
22	294 41 5.2	40.24	+ 9.3	— 0 30 27.6	— 0.41	1.294 1478	1.306 7071	1.307 8591
30	294 46 27.1	40.23	9.3	0 30 30.9	0.41	1.294 1754	1.308 9443	1.309 9580
Dec. 8	294 51 48.9	40.23	9.3	0 30 34.1	0.41	1.294 2030	1.310 8957	1.311 7541
16	294 57 10.7	40.22	9.3	0 30 37.4	0.41	1.294 2305	1.312 5303	1.313 2217
24	295 2 32.4	40.22	9.3	0 30 40.6	0.41	1.294 2580	1.313 8258	1.314 3400
32	295 7 54.2	40.21	+ 9.3	— 0 30 43.9	— 0.40	1.294 2854	1.314 7621	1.315 0904
40	295 13 15.8	40.21	+ 9.3	— 0 30 47.1	— 0.40	1.294 3128	1.315 3241	. . . .



## NEPTUNE.

## GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.			Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.			Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
											At Date.	At Intermediate Date.
	°	'	"	"	"	°	'	"	"			
Jan. 6	107	56	1.1	21.84	- 35.6	0	41	27.6	+ 0.62	1.476 5007	1.462 0231	1.462 0111
14	107	58	55.8	21.84	35.5	0	41	22.6	0.62	1.476 5029	1.462 0743	1.462 2123
22	108	1	50.5	21.84	35.5	0	41	17.7	0.62	1.476 5052	1.462 4241	1.462 7081
30	108	4	45.2	21.84	35.4	0	41	12.7	0.62	1.476 5075	1.463 0623	1.463 4847
Feb. 7	108	7	39.9	21.84	35.4	0	41	7.7	0.62	1.476 5098	1.463 9730	1.464 5246
15	108	10	34.6	21.83	- 35.3	0	41	2.7	+ 0.62	1.476 5120	1.465 1359	1.465 8030
23	108	13	29.3	21.83	35.2	0	40	57.8	0.62	1.476 5143	1.466 5219	1.467 2886
Mar. 3	108	16	24.0	21.83	35.2	0	40	52.8	0.62	1.476 5166	1.468 0991	1.468 9492
11	108	19	18.6	21.83	35.1	0	40	47.8	0.62	1.476 5189	1.469 8343	1.470 7491
19	108	22	13.3	21.83	35.0	0	40	42.8	0.62	1.476 5211	1.471 6884	1.472 6473
27	108	25	7.9	21.83	- 35.0	0	40	37.8	+ 0.62	1.476 5234	1.473 6213	1.474 6062
Apr. 4	108	28	2.6	21.83	34.9	0	40	32.8	0.62	1.476 5257	1.475 5973	1.476 5895
12	108	30	57.2	21.83	34.8	0	40	27.9	0.62	1.476 5279	1.477 5780	1.478 5580
20	108	33	51.9	21.83	34.8	0	40	22.9	0.62	1.476 5302	1.479 5251	1.480 4751
28	108	36	46.5	21.83	34.7	0	40	17.9	0.62	1.476 5325	1.481 4044	1.482 3091
May 6	108	39	41.1	21.83	- 34.6	0	40	12.9	+ 0.62	1.476 5347	1.483 1854	1.484 0296
14	108	42	35.7	21.83	34.6	0	40	7.9	0.63	1.476 5369	1.484 8382	1.485 6079
22	108	45	30.3	21.83	34.5	0	40	2.9	0.63	1.476 5391	1.486 3357	1.487 0192
30	108	48	25.0	21.82	34.5	0	39	57.9	0.63	1.476 5414	1.487 6561	1.488 2439
June 7	108	51	19.6	21.82	34.4	0	39	52.9	0.63	1.476 5437	1.488 7803	1.489 2631
15	108	54	14.2	21.82	- 34.4	0	39	47.9	+ 0.63	1.476 5460	1.489 6905	1.490 0611
23	108	57	8.8	21.82	34.3	0	39	42.9	0.63	1.476 5482	1.490 3739	1.490 6280
July 1	109	0	3.4	21.82	34.3	0	39	37.9	0.63	1.476 5505	1.490 8225	1.490 9565
9	109	2	57.9	21.82	34.2	0	39	32.9	0.63	1.476 5528	1.491 0293	1.491 0406
17	109	5	52.5	21.82	34.1	0	39	27.9	0.63	1.476 5551	1.490 9905	1.490 8792
25	109	8	47.1	21.82	- 34.1	0	39	22.9	+ 0.63	1.476 5573	1.490 7072	1.490 4751
Aug. 2	109	11	41.6	21.82	34.0	0	39	17.9	0.63	1.476 5596	1.490 1835	1.489 8331
10	109	14	36.2	21.82	33.9	0	39	12.9	0.63	1.476 5619	1.489 4251	1.488 9611
18	109	17	30.8	21.82	33.9	0	39	7.8	0.63	1.476 5642	1.488 4430	1.487 8727
26	109	20	25.3	21.82	33.8	0	39	2.8	0.63	1.476 5664	1.487 2521	1.486 5832
Sept. 3	109	23	19.8	21.82	- 33.8	0	38	57.8	+ 0.63	1.476 5687	1.485 8685	1.485 1106
11	109	26	14.4	21.82	33.7	0	38	52.8	0.63	1.476 5710	1.484 3127	1.483 4782
19	109	29	8.9	21.82	33.6	0	38	47.8	0.63	1.476 5733	1.482 6103	1.481 7125
27	109	32	3.4	21.81	33.6	0	38	42.7	0.63	1.476 5755	1.480 7885	1.479 8420
Oct. 5	109	34	58.0	21.81	33.5	0	38	37.7	0.63	1.476 5778	1.478 8771	1.477 8982
13	109	37	52.5	21.81	- 33.5	0	38	32.7	+ 0.63	1.476 5801	1.476 9097	1.475 9162
21	109	40	47.0	21.81	33.4	0	38	27.7	0.63	1.476 5824	1.474 9224	1.473 9333
29	109	43	41.5	21.81	33.3	0	38	22.6	0.63	1.476 5846	1.472 9536	1.471 9879
Nov. 6	109	46	36.0	21.81	33.3	0	38	17.6	0.63	1.476 5869	1.471 0413	1.470 1190
14	109	49	30.5	21.81	33.2	0	38	12.6	0.63	1.476 5892	1.469 2262	1.468 3674
22	109	52	25.0	21.81	- 33.1	0	38	7.6	+ 0.63	1.476 5915	1.467 5470	1.466 7694
30	109	55	19.5	21.81	33.1	0	38	2.5	0.63	1.476 5937	1.466 0392	1.465 3608
Dec. 8	109	58	14.0	21.81	33.0	0	37	57.5	0.63	1.476 5960	1.464 7382	1.464 1750
16	110	1	8.4	21.81	33.0	0	37	52.5	0.63	1.476 5983	1.463 6743	1.463 2391
24	110	4	2.9	21.81	32.9	0	37	47.4	0.63	1.476 6006	1.462 8720	1.462 5750
32	110	6	57.4	21.81	- 32.8	0	37	42.3	+ 0.63	1.476 6028	1.462 3501	1.462 1991
40	110	9	51.8	21.81	- 32.8	0	37	37.3	+ 0.63	1.476 6051	1.462 1236	. . . .

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X		Reduc. to Mean Eq'x of Jan. o.	Y		Reduc. to Mean Eq'x of Jan. o.	Z		Reduc. to Mean Eq'x of Jan. o.
	True Equinox.			True Equinox.			True Equinox.		
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Jan. 1	+0.174 4906	+0.183 0904	+ 716	-0.887 7213	-0.886 2632	+ 57	-0.385 1059	-0.384 4734	+ 193
2	0.191 6763	0.200 2475	703	0.884 7361	0.883 1401	67	0.383 8111	0.383 1189	198
3	0.208 8034	0.217 3435	690	0.881 4753	0.879 7418	76	0.382 3969	0.381 6451	202
4	0.225 8671	0.234 3734	678	0.877 9398	0.876 0693	85	0.380 8636	0.380 0525	207
5	0.242 8618	0.251 3316	665	0.874 1305	0.872 1234	93	0.379 2117	0.378 3414	211
6	+0.259 7821	+0.268 2126	+ 653	-0.870 0483	-0.867 9052	+ 102	-0.377 4415	-0.376 5122	+ 215
7	0.276 6225	0.285 0110	640	0.865 6943	0.863 4158	110	0.375 5534	0.374 5653	219
8	0.293 3776	0.301 7215	627	0.861 0697	0.858 6563	118	0.373 5479	0.372 5013	223
9	0.310 0420	0.318 3384	614	0.856 1756	0.853 6280	125	0.371 4255	0.370 3207	226
10	0.326 6101	0.334 8563	602	0.851 0137	0.848 3328	132	0.369 1869	0.368 0242	229
11	+0.343 0763	+0.351 2695	+ 590	-0.845 5857	-0.842 7724	+ 139	-0.366 8327	-0.365 6125	+ 232
12	0.359 4352	0.367 5728	578	0.839 8932	0.836 9483	146	0.364 3637	0.363 0864	235
13	0.375 6815	0.383 7606	566	0.833 9381	0.830 8628	153	0.361 7807	0.360 4468	237
14	0.391 8095	0.399 8275	554	0.827 7227	0.824 5182	159	0.359 0847	0.357 6946	239
15	0.407 8140	0.415 7684	542	0.821 2494	0.817 9167	164	0.356 2765	0.354 8307	241
16	+0.423 6901	+0.431 5784	+ 530	-0.814 5204	-0.811 0608	+ 170	-0.353 3572	-0.351 8563	+ 243
17	0.439 4328	0.447 2526	518	0.807 5382	0.803 9530	175	0.350 3280	0.348 7725	245
18	0.455 0373	0.462 7862	506	0.800 3055	0.796 5961	181	0.347 1899	0.345 5804	247
19	0.470 4988	0.478 1746	495	0.792 8250	0.788 9927	185	0.343 9442	0.342 2814	248
20	0.485 8130	0.493 4134	483	0.785 0994	0.781 1455	190	0.340 5921	0.338 8765	250
21	+0.500 9753	+0.508 4980	+ 471	-0.777 1314	-0.773 0572	+ 194	-0.337 1348	-0.335 3671	+ 251
22	0.515 9812	0.523 4243	460	0.768 9235	0.764 7305	198	0.333 5735	0.331 7542	252
23	0.530 8268	0.538 1882	448	0.760 4785	0.756 1679	202	0.329 9093	0.328 0390	253
24	0.545 5080	0.552 7856	437	0.751 7991	0.747 3723	206	0.326 1436	0.324 2230	254
25	0.560 0206	0.567 2125	425	0.742 8879	0.738 3461	209	0.322 2775	0.320 3071	254
26	+0.574 3607	+0.581 4646	+ 413	-0.733 7473	-0.729 0921	+ 212	-0.318 3120	-0.316 2923	+ 255
27	0.588 5238	0.595 5377	401	0.724 3806	0.719 6131	215	0.314 2483	0.312 1801	254
28	0.602 5059	0.609 4278	390	0.714 7901	0.709 9117	218	0.310 0878	0.307 9715	253
29	0.616 3029	0.623 1306	379	0.704 9783	0.699 9904	220	0.305 8315	0.303 6678	252
30	0.629 9105	0.636 6420	368	0.694 9482	0.689 8523	223	0.301 4807	0.299 2702	252
31	+0.643 3246	+0.649 9578	+ 357	-0.684 7029	-0.679 5005	+ 225	-0.297 0366	-0.294 7800	+ 252
Feb. 1	0.656 5411	0.663 0740	346	0.674 2455	0.668 9381	227	0.292 5005	0.290 1984	252
2	0.669 5559	0.675 9864	335	0.663 5788	0.658 1680	228	0.287 8738	0.285 5268	252
3	0.682 3649	0.688 6909	325	0.652 7060	0.647 1934	230	0.283 1577	0.280 7666	252
4	0.694 9639	0.701 1834	314	0.641 6305	0.636 0178	231	0.278 3536	0.275 9191	252
5	+0.707 3489	+0.713 4599	+ 304	-0.630 3557	-0.624 6446	+ 232	-0.273 4631	-0.270 9859	+ 251
6	0.719 5160	0.725 5166	294	0.618 8849	0.613 0771	233	0.268 4876	0.265 9684	249
7	0.731 4612	0.737 3493	284	0.607 2217	0.601 3192	234	0.263 4285	0.260 8681	248
8	0.743 1804	0.748 9540	274	0.595 3700	0.589 3746	235	0.258 2874	0.255 6867	246
9	0.754 6697	0.760 3270	264	0.583 3335	0.577 2472	236	0.253 0661	0.250 4259	244
10	+0.765 9255	+0.771 4647	+ 254	-0.571 1163	-0.564 9412	+ 236	-0.247 7663	-0.245 0875	+ 242
11	0.776 9441	0.782 3633	245	0.558 7224	0.552 4606	236	0.242 3897	0.239 6732	240
12	0.787 7220	0.793 0196	236	0.546 1562	0.539 8099	236	0.236 9381	0.234 1849	238
13	0.798 2559	0.803 4304	227	0.533 4221	0.526 9935	236	0.231 4135	0.228 6245	236
14	0.808 5427	0.813 5925	218	0.520 5245	0.514 0158	235	0.225 8179	0.222 9940	233
15	+0.818 5796	+0.823 5035	+ 209	-0.507 4678	-0.500 8811	+ 235	-0.220 1531	-0.217 2954	+ 230

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Feb. 15	+0.818 5796	+0.823 5035	+ 209	-0.507 4678	-0.500 8811	+ 235	-0.220 1531	-0.217 2954	+ 230
16	0.828 3640	0.833 1607	200	0.494 2563	0.487 5939	234	0.214 4211	0.211 5305	227
17	0.837 8933	0.842 5615	191	0.480 8945	0.474 1586	234	0.208 6239	0.205 7014	225
18	0.847 1651	0.851 7037	182	0.467 3868	0.460 5796	233	0.202 7633	0.199 8099	222
19	0.856 1771	0.860 5850	174	0.453 7375	0.446 8611	232	0.196 8413	0.193 8579	219
20	+0.864 9271	+0.869 2031	+ 166	-0.439 9508	-0.433 0072	+ 231	-0.190 8598	-0.187 8473	+ 215
21	0.873 4129	0.877 5562	158	0.426 0309	0.419 0223	230	0.184 8207	0.181 7801	212
22	0.881 6326	0.885 6419	150	0.411 9819	0.404 9103	229	0.178 7257	0.175 6578	208
23	0.889 5839	0.893 4584	142	0.397 8081	0.390 6757	228	0.172 5767	0.169 4825	204
24	0.897 2650	0.901 0036	135	0.383 5136	0.376 3224	227	0.166 3754	0.163 2557	200
25	+0.904 6738	+0.908 2755	+ 128	-0.369 1025	-0.361 8545	+ 226	-0.160 1237	-0.156 9795	+ 197
26	0.911 8083	0.915 2720	120	0.354 5790	0.347 2764	224	0.153 8234	0.150 6556	193
27	0.918 6664	0.921 9912	113	0.339 9473	0.332 5923	223	0.147 4763	0.144 2858	188
28	0.925 2463	0.928 4313	106	0.325 2118	0.317 8064	221	0.141 0842	0.137 8719	183
Mar. 1	0.931 5460	0.934 5902	99	0.310 3767	0.302 9231	219	0.134 6490	0.131 4158	179
2	+0.937 5637	+0.940 4662	+ 93	-0.295 4463	-0.287 9468	+ 217	-0.128 1725	-0.124 9194	+ 174
3	0.943 2975	0.946 0574	86	0.280 4251	0.272 8819	215	0.121 6567	0.118 3846	170
4	0.948 7457	0.951 3622	80	0.265 3176	0.257 7329	213	0.115 1034	0.111 8133	165
5	0.953 9066	0.956 3788	74	0.250 1284	0.242 5046	211	0.108 5146	0.105 2075	160
6	0.958 7785	0.961 1056	68	0.234 8620	0.227 2013	210	0.101 8923	0.098 5691	155
7	+0.963 3598	+0.965 5410	+ 63	-0.219 5229	-0.211 8276	+ 208	-0.095 2383	-0.091 9001	+ 151
8	0.967 6490	0.969 6835	57	0.204 1160	0.196 3886	205	0.088 5548	0.085 2026	146
9	0.971 6446	0.973 5318	52	0.188 6461	0.180 8891	203	0.081 8438	0.078 4787	141
10	0.975 3452	0.977 0846	46	0.173 1183	0.165 3342	201	0.075 1075	0.071 7305	135
11	0.978 7498	0.980 3408	41	0.157 5376	0.149 7290	199	0.068 3481	0.064 9605	130
12	+0.981 8574	+0.983 2996	+ 37	-0.141 9092	-0.134 0788	+ 197	-0.061 5679	-0.058 1707	+ 125
13	0.984 6673	0.985 9604	32	0.126 2383	0.118 3885	194	0.054 7691	0.051 3634	120
14	0.987 1789	0.988 3228	27	0.110 5300	0.102 6635	192	0.047 9538	0.044 5407	115
15	0.989 3921	0.990 3867	22	0.094 7895	0.086 9087	190	0.041 1244	0.037 7052	110
16	0.991 3067	0.992 1520	18	0.079 0218	0.071 1293	187	0.034 2833	0.030 8590	104
17	+0.992 9227	+0.993 6188	+ 14	-0.063 2318	-0.055 3299	+ 184	-0.027 4326	-0.024 0043	+ 98
18	0.994 2404	0.994 7874	11	0.047 4241	0.039 5151	182	0.020 5743	0.017 1429	92
19	0.995 2599	0.995 6579	7	0.031 6035	0.023 6900	179	0.013 7104	0.010 2771	86
20	0.995 9816	0.996 2309	+ 3	-0.015 7751	-0.007 8595	177	-0.006 8432	-0.003 4090	80
21	0.996 4059	0.996 5066	0	+0.000 0564	+0.007 9720	174	+0.000 0253	+0.003 4594	74
22	+0.996 5332	+0.996 4857	- 4	+0.015 8869	+0.023 8005	+ 171	+0.006 8932	+0.010 3263	+ 68
23	0.996 3640	0.996 1683	7	0.031 7121	0.039 6212	168	0.013 7585	0.017 1896	62
24	0.995 8985	0.995 5548	10	0.047 5272	0.055 4296	165	0.020 6194	0.024 0475	57
25	0.995 1372	0.994 6459	12	0.063 3278	0.071 2214	162	0.027 4738	0.030 8980	51
26	0.994 0809	0.993 4422	15	0.079 1097	0.086 9923	159	0.034 3200	0.037 7394	45
27	+0.992 7299	+0.991 9440	- 17	+0.094 8685	+0.102 7378	+ 156	+0.041 1561	+0.044 5697	+ 40
28	0.991 0847	0.990 1520	19	0.110 5996	0.118 4533	153	0.047 9800	0.051 3868	34
29	0.989 1460	0.988 0668	21	0.126 2985	0.134 1345	150	0.054 7899	0.058 1890	28
30	0.986 9145	0.985 6891	23	0.141 9609	0.149 7770	147	0.061 5839	0.064 9744	22
31	0.984 3908	0.983 0196	25	0.157 5823	0.165 3763	143	0.068 3602	0.071 7411	16
Apr. 1	+0.981 5756	+0.980 0590	- 26	+0.173 1584	+0.180 9279	+ 140	+0.075 1168	+0.078 4872	+ 10
2	+0.978 4698	+0.976 8082	- 27	+0.188 6844	+0.196 4273	+ 136	+0.081 8519	+0.085 2107	+ 4

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X		Reduc. to Mean Eq'x of Jan. o.	Y		Reduc. to Mean Eq'x of Jan. o.	Z		Reduc. to Mean Eq'x of Jan. o.
	True Equinox.			True Equinox.			True Equinox.		
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Apr. 1	+0.981 5756	+0.980 0590	- 26	+0.173 1584	+0.180 9279	+ 140	+0.075 1168	+0.078 4872	+ 10
2	0.978 4698	0.976 8082	27	0.188 6844	0.196 4273	136	0.081 8519	0.085 2107	+ 4
3	0.975 0742	0.973 2680	28	0.204 1561	0.211 8701	133	0.088 5634	0.091 9097	- 2
4	0.971 3897	0.969 4394	29	0.219 5687	0.227 2515	129	0.095 2494	0.098 5822	8
5	0.967 4172	0.965 3233	29	0.234 9177	0.242 5669	126	0.101 9079	0.105 2262	14
6	+0.963 1579	+0.960 9210	- 30	+0.250 1984	+0.257 8117	+ 122	+0.108 5370	+0.111 8398	- 20
7	0.958 6128	0.956 2335	30	0.265 4061	0.272 9810	119	0.115 1346	0.118 4209	26
8	0.953 7834	0.951 2626	30	0.280 5359	0.288 0702	115	0.121 6986	0.124 9673	32
9	0.948 6713	0.946 0098	30	0.295 5832	0.303 0743	112	0.128 2269	0.131 4770	38
10	0.943 2783	0.940 4770	30	0.310 5429	0.317 9885	109	0.134 7174	0.137 9479	44
11	+0.937 6062	+0.934 6662	- 29	+0.325 4105	+0.332 8083	+ 106	+0.141 1681	+0.144 3778	- 50
12	0.931 6573	0.928 5798	29	0.340 1814	0.347 5292	103	0.147 5767	0.150 7647	55
13	0.925 4340	0.922 2202	28	0.354 8511	0.362 1466	99	0.153 9415	0.157 1068	60
14	0.918 9387	0.915 5899	27	0.369 4151	0.376 6561	95	0.160 2604	0.163 4021	66
15	0.912 1741	0.908 6916	25	0.383 8692	0.391 0538	91	0.166 5316	0.169 6487	71
16	+0.905 1428	+0.901 5280	- 23	+0.398 2095	+0.405 3357	+ 87	+0.172 7532	+0.175 8449	- 77
17	0.897 8474	0.894 1015	21	0.412 4319	0.419 4977	83	0.178 9236	0.181 9890	82
18	0.890 2905	0.886 4149	19	0.426 5326	0.433 5361	80	0.185 0410	0.188 0794	88
19	0.882 4749	0.878 4709	17	0.440 5078	0.447 4473	77	0.191 1039	0.194 1144	94
20	0.874 4031	0.870 2719	15	0.454 3541	0.461 2277	74	0.197 1106	0.200 0924	99
21	+0.866 0777	+0.861 8207	- 13	+0.468 0677	+0.474 8735	+ 70	+0.203 0596	+0.206 0120	- 104
22	0.857 5014	0.853 1200	11	0.481 6447	0.488 3809	66	0.208 9493	0.211 8714	109
23	0.848 6770	0.844 1726	8	0.495 0817	0.501 7465	62	0.214 7780	0.217 6690	114
24	0.839 6072	0.834 9810	- 4	0.508 3751	0.514 9670	58	0.220 5443	0.223 4037	119
25	0.830 2944	0.825 5478	0	0.521 5218	0.528 0389	54	0.226 2469	0.229 0739	124
26	+0.820 7415	+0.815 8759	+ 4	+0.534 5180	+0.540 9585	+ 51	+0.231 8843	+0.234 6780	- 128
27	0.810 9513	0.805 9681	8	0.547 3600	0.553 7221	47	0.237 4547	0.240 2144	133
28	0.800 9265	0.795 8270	12	0.560 0445	0.566 3266	43	0.242 9568	0.245 6818	137
29	0.790 6699	0.785 4555	16	0.572 5681	0.578 7685	40	0.248 3892	0.251 0788	142
30	0.780 1843	0.774 8565	20	0.584 9273	0.591 0442	37	0.253 7505	0.256 4039	147
May 1	+0.769 4726	+0.764 0329	+ 25	+0.597 1187	+0.603 1503	+ 34	+0.259 0390	+0.261 6555	- 152
2	0.758 5377	0.752 9875	30	0.609 1387	0.615 0834	30	0.264 2533	0.266 8322	157
3	0.747 3827	0.741 7235	35	0.620 9839	0.626 8398	27	0.269 3919	0.271 9324	161
4	0.736 0105	0.730 2439	40	0.632 6507	0.638 4162	24	0.274 4533	0.276 9546	165
5	0.724 4243	0.718 5521	46	0.644 1357	0.649 8089	21	0.279 4360	0.281 8973	169
6	+0.712 6277	+0.706 6515	+ 52	+0.655 4352	+0.661 0143	+ 19	+0.284 3384	+0.286 7589	- 173
7	0.700 6239	0.694 5455	58	0.666 5456	0.672 0288	16	0.289 1588	0.291 5378	177
8	0.688 4167	0.682 2381	64	0.677 4635	0.682 8491	13	0.293 8958	0.296 2326	181
9	0.676 0101	0.669 7332	70	0.688 1854	0.693 4719	10	0.298 5480	0.300 8418	184
10	0.663 4080	0.657 0350	76	0.698 7083	0.703 8942	8	0.303 1138	0.305 3638	188
11	+0.650 6147	+0.644 1477	+ 83	+0.709 0291	+0.714 1127	+ 5	+0.307 5918	+0.309 7975	- 191
12	0.637 6344	0.631 0755	90	0.719 1447	0.724 1248	3	0.311 9808	0.314 1415	194
13	0.624 4714	0.617 8227	97	0.729 0525	0.733 9276	+ 2	0.316 2795	0.318 3947	197
14	0.611 1299	0.604 3936	104	0.738 7498	0.743 5187	0	0.320 4869	0.322 5559	200
15	0.597 6143	0.590 7925	111	0.748 2341	0.752 8958	- 2	0.324 6017	0.326 6241	203
16	+0.583 9288	+0.577 0237	+ 119	+0.757 5034	+0.762 0567	- 3	+0.328 6230	+0.330 5983	- 206
17	+0.570 0776	+0.563 0912	+ 128	+0.766 5554	+0.770 9992	- 5	+0.332 5499	+0.334 4776	- 208

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
May 17	+0.570 0776	+0.563 0912	+ 128	+0.766 5554	+0.770 9992	- 5	+0.332 5499	+0.334 4776	- 208
18	0.556 0649	0.548 9992	137	0.775 3878	0.779 7210	6	0.336 3813	0.338 2609	211
19	0.541 8947	0.534 7519	145	0.783 9985	0.788 2201	7	0.340 1164	0.341 9476	213
20	0.527 5713	0.520 3534	153	0.792 3855	0.796 4945	8	0.343 7544	0.345 5367	215
21	0.513 0987	0.505 8078	162	0.800 5468	0.804 5422	9	0.347 2944	0.349 0274	217
22	+0.498 4810	+0.491 1190	+ 171	+0.808 4804	+0.812 3612	- 10	+0.350 7355	+0.352 4187	- 219
23	0.483 7222	0.476 2912	180	0.816 1844	0.819 9496	10	0.354 0769	0.355 7100	221
24	0.468 8264	0.461 3284	189	0.823 6568	0.827 3056	10	0.357 3179	0.358 9005	223
25	0.453 7977	0.446 2348	198	0.830 8959	0.834 4274	10	0.360 4577	0.361 9894	225
26	0.438 6403	0.431 0145	208	0.837 8998	0.841 3130	10	0.363 4955	0.364 9759	227
27	+0.423 3581	+0.415 6715	+ 218	+0.844 6668	+0.847 9608	- 10	+0.366 4306	+0.367 8594	- 228
28	0.407 9553	0.400 2099	227	0.851 1949	0.854 3688	9	0.369 2622	0.370 6390	229
29	0.392 4358	0.384 6336	237	0.857 4823	0.860 5352	8	0.371 9896	0.373 3139	230
30	0.376 8037	0.368 9468	246	0.863 5273	0.866 4582	6	0.374 6118	0.375 8833	231
31	0.361 0633	0.353 1539	255	0.869 3279	0.872 1361	5	0.377 1282	0.378 3465	231
June 1	+0.345 2190	+0.337 2593	+ 265	+0.874 8826	+0.877 5670	- 4	+0.379 5381	+0.380 7029	- 232
2	0.329 2752	0.321 2673	274	0.880 1893	0.882 7492	- 2	0.381 8407	0.382 9515	232
3	0.313 2362	0.305 1824	284	0.885 2464	0.887 6808	0	0.384 0351	0.385 0915	232
4	0.297 1066	0.289 0093	293	0.890 0521	0.892 3602	+ 2	0.386 1206	0.387 1223	231
5	0.280 8912	0.272 7529	303	0.894 6048	0.896 7857	5	0.388 0964	0.389 0429	231
6	+0.264 5950	+0.256 4182	+ 313	+0.898 9028	+0.900 9560	+ 8	+0.389 9617	+0.390 8528	- 230
7	0.248 2230	0.240 0102	323	0.902 9450	0.904 8697	11	0.391 7160	0.392 5514	230
8	0.231 7803	0.223 5341	333	0.906 7301	0.908 5260	14	0.393 3589	0.394 1383	229
9	0.215 2721	0.206 9950	343	0.910 2572	0.911 9236	18	0.394 8896	0.395 6128	229
10	0.198 7035	0.190 3981	353	0.913 5251	0.915 0618	22	0.396 3078	0.396 9747	228
11	+0.182 0795	+0.173 7483	+ 363	+0.916 5335	+0.917 9402	+ 26	+0.397 6133	+0.398 2237	- 227
12	0.165 4051	0.157 0506	373	0.919 2819	0.920 5584	31	0.398 8058	0.399 3596	226
13	0.148 6853	0.140 3100	383	0.921 7698	0.922 9160	35	0.399 8851	0.400 3823	225
14	0.131 9251	0.123 5313	393	0.923 9969	0.925 0126	40	0.400 8512	0.401 2917	223
15	0.115 1292	0.106 7193	403	0.925 9630	0.926 8481	45	0.401 7038	0.402 0876	222
16	+0.098 3023	+0.089 8786	+ 413	+0.927 6678	+0.928 4222	+ 51	+0.402 4430	+0.402 7700	- 220
17	0.081 4490	0.073 0139	423	0.929 1112	0.929 7348	57	0.403 0687	0.403 3390	219
18	0.064 5740	0.056 1298	432	0.930 2930	0.930 7858	64	0.403 5809	0.403 7944	217
19	0.047 6820	0.039 2310	442	0.931 2133	0.931 5754	70	0.403 9795	0.404 1362	215
20	0.030 7775	0.022 3220	452	0.931 8721	0.932 1034	77	0.404 2646	0.404 3646	212
21	+0.013 8651	+0.005 4073	+ 461	+0.932 2693	+0.932 3698	+ 84	+0.404 4363	+0.404 4796	- 209
22	-0.003 0509	-0.011 5088	470	0.932 4049	0.932 3746	91	0.404 4946	0.404 4812	206
23	0.019 9659	0.028 4217	479	0.932 2790	0.932 1181	98	0.404 4395	0.404 3695	204
24	0.036 8755	0.045 3269	488	0.931 8919	0.931 6004	106	0.404 2711	0.404 1445	201
25	0.053 7752	0.062 2200	497	0.931 2436	0.930 8215	114	0.403 9896	0.403 8064	198
26	-0.070 6607	-0.079 0967	+ 505	+0.930 3340	+0.929 7813	+ 122	+0.403 5949	+0.403 3551	- 194
27	0.087 5275	0.095 9525	513	0.929 1632	0.928 4799	130	0.403 0870	0.402 7907	190
28	0.104 3712	0.112 7830	522	0.927 7314	0.926 9176	139	0.402 4661	0.402 1132	186
29	0.121 1872	0.129 5833	530	0.926 0386	0.925 0944	148	0.401 7321	0.401 3228	183
30	0.137 9707	0.146 3488	538	0.924 0851	0.923 0106	157	0.400 8852	0.400 4194	179
July 1	-0.154 7170	-0.163 0747	+ 546	+0.921 8710	+0.920 6663	+ 166	+0.399 9254	+0.399 4032	- 175
2	-0.171 4213	-0.179 7561	+ 553	+0.919 3965	+0.918 0618	+ 176	+0.398 8527	+0.398 2741	- 171

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.	
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	Noon.	
July	1	-0.154 7170	-0.163 0747	+ 546	+0.921 8710	+0.920 6663	+ 166	+0.399 9254	+0.399 4032	- 175
	2	0.171 4213	0.179 7561	553	0.919 3965	0.918 0618	176	0.398 8527	0.398 2741	171
	3	0.188 0786	0.196 3881	560	0.916 6621	0.915 1975	186	0.397 6673	0.397 0324	167
	4	0.204 6841	0.212 9659	567	0.913 6682	0.912 0742	197	0.396 3694	0.395 6783	162
	5	0.221 2328	0.229 4842	573	0.910 4156	0.908 6925	207	0.394 9592	0.394 2120	157
	6	-0.237 7194	-0.245 9378	+ 580	+0.906 9051	+0.905 0534	+ 218	+0.393 4369	+0.392 6339	- 152
	7	0.254 1387	0.262 3216	586	0.903 1376	0.901 1578	228	0.391 8031	0.390 9445	147
	8	0.270 4858	0.278 6307	592	0.899 1143	0.897 0072	239	0.390 0582	0.389 1442	142
	9	0.286 7557	0.294 8602	598	0.894 8367	0.892 6030	250	0.388 2027	0.387 2337	137
	10	0.302 9436	0.311 0053	603	0.890 3062	0.887 9466	262	0.386 2374	0.385 2138	131
	11	-0.319 0446	-0.327 0610	+ 608	+0.885 5243	+0.883 0396	+ 274	+0.384 1630	+0.383 0850	- 126
	12	0.335 0541	0.343 0232	613	0.880 4927	0.877 8838	285	0.381 9800	0.380 8481	120
	13	0.350 9678	0.358 8873	618	0.875 2131	0.872 4809	297	0.379 6893	0.378 5038	115
	14	0.366 7812	0.374 6489	622	0.869 6873	0.866 8326	309	0.377 2917	0.376 0531	109
	15	0.382 4898	0.390 3035	625	0.863 9170	0.860 9408	321	0.374 7880	0.373 4966	103
	16	-0.398 0894	-0.405 8470	+ 629	+0.857 9041	+0.854 8072	+ 333	+0.372 1790	+0.370 8352	- 97
	17	0.413 5758	0.421 2752	633	0.851 6503	0.848 4337	345	0.369 4654	0.368 0697	91
	18	0.428 9448	0.436 5840	636	0.845 1575	0.841 8221	358	0.366 6481	0.365 2008	84
	19	0.444 1924	0.451 7694	638	0.838 4277	0.834 9745	371	0.363 7280	0.362 2297	78
	20	0.459 3145	0.466 8272	641	0.831 4627	0.827 8927	384	0.360 7060	0.359 1571	71
	21	-0.474 3071	-0.481 7537	+ 643	+0.824 2646	+0.820 5787	+ 396	+0.357 5830	+0.355 9839	- 65
	22	0.489 1664	0.496 5448	644	0.816 8353	0.813 0346	410	0.354 3598	0.352 7109	57
	23	0.503 8884	0.511 1967	645	0.809 1767	0.805 2620	423	0.351 0372	0.349 3389	51
	24	0.518 4692	0.525 7055	645	0.801 2906	0.797 2629	436	0.347 6161	0.345 8689	44
	25	0.532 9051	0.540 0676	645	0.793 1790	0.789 0393	449	0.344 0973	0.342 3016	37
	26	-0.547 1922	-0.554 2785	+ 645	+0.784 8439	+0.780 5931	+ 463	+0.340 4818	+0.338 6380	- 29
	27	0.561 3261	0.568 3345	644	0.776 2871	0.771 9262	476	0.336 7702	0.334 8786	22
	28	0.575 3031	0.582 2315	643	0.767 5106	0.763 0406	489	0.332 9634	0.331 0246	15
	29	0.589 1191	0.595 9654	642	0.758 5164	0.753 9384	503	0.329 0623	0.327 0767	- 8
	30	0.602 7700	0.609 5323	641	0.749 3068	0.744 6218	516	0.325 0678	0.323 0358	0
Aug.	31	-0.616 2516	-0.622 9274	+ 639	+0.739 8838	+0.735 0931	+ 529	+0.320 9808	+0.318 9029	+ ;
	1	0.629 5593	0.636 1467	636	0.730 2501	0.725 3549	543	0.316 8022	0.314 6789	15
	2	0.642 6891	0.649 1862	633	0.720 4080	0.715 4097	556	0.312 5332	0.310 3652	23
	3	0.655 6372	0.662 0414	630	0.710 3603	0.705 2603	570	0.308 1750	0.305 9628	31
	4	0.668 3984	0.674 7081	627	0.700 1099	0.694 9097	583	0.303 7287	0.301 4729	39
	5	-0.680 9695	-0.687 1824	+ 623	+0.689 6598	+0.684 3609	+ 596	+0.299 1955	+0.296 8967	+ 47
	6	0.693 3463	0.699 4606	619	0.679 0132	0.673 6171	609	0.294 5768	0.292 2359	55
	7	0.705 5250	0.711 5390	615	0.668 1731	0.662 6816	622	0.289 8741	0.287 4917	63
	8	0.717 5019	0.723 4136	610	0.657 1429	0.651 5576	636	0.285 0888	0.282 6656	71
	9	0.729 2736	0.735 0814	605	0.645 9260	0.640 2486	649	0.280 2224	0.277 7593	80
	10	-0.740 8366	-0.746 5387	+ 599	+0.634 5259	+0.628 7583	+ 661	+0.275 2764	+0.272 7740	+ 88
	11	0.752 1874	0.757 7823	593	0.622 9461	0.617 0898	674	0.270 2522	0.267 7113	96
	12	0.763 3231	0.768 8093	586	0.611 1897	0.605 2464	687	0.265 1514	0.262 5728	105
	13	0.774 2407	0.779 6166	579	0.599 2603	0.593 2319	700	0.259 9757	0.257 3602	113
	14	0.784 9369	0.790 2011	572	0.587 1615	0.581 0496	712	0.254 7264	0.252 0746	122
	15	-0.795 4089	-0.800 5599	+ 564	+0.574 8966	+0.568 7030	+ 724	+0.249 4050	+0.246 7178	+ 130
16	-0.805 6539	-0.810 6904	+ 556	+0.562 4692	+0.556 1957	+ 736	+0.244 0132	+0.241 2914	+ 139	

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.			Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.			Reduc. to Mean Eq'x of Jan. o.
	Noon.	Midnight.		Noon.	Noon.	Midnight.		Noon.	Noon.	Midnight.	
Aug. 16	-0.805 6539	-0.810 6904	+ 556	+0.562 4692	+0.556 1957	+ 736	+0.244 0132	+0.241 2914	+ 139		
17	0.815 6691	0.820 5897	548	0.549 8828	0.543 5311	748	0.238 5526	0.235 7969	147		
18	0.825 4519	0.830 2553	539	0.537 1410	0.530 7129	760	0.233 0245	0.230 2357	155		
19	0.834 9997	0.839 6847	530	0.524 2471	0.517 7441	772	0.227 4306	0.224 6094	164		
20	0.844 3101	0.848 8755	520	0.511 2044	0.504 6284	783	0.221 7724	0.218 9197	172		
21	-0.853 3805	-0.857 8249	+ 509	+0.498 0166	+0.491 3693	+ 794	+0.216 0514	+0.213 1677	+ 181		
22	0.862 2084	0.866 5307	499	0.484 6870	0.477 9700	805	0.210 2689	0.207 3551	190		
23	0.870 7914	0.874 9902	488	0.471 2188	0.464 4339	815	0.204 4264	0.201 4832	199		
24	0.879 1268	0.883 2007	477	0.457 6156	0.450 7643	826	0.198 5255	0.195 5536	208		
25	0.887 2117	0.891 1595	466	0.443 8805	0.436 9647	837	0.192 5677	0.189 5678	216		
26	-0.895 0438	-0.898 8642	+ 454	+0.430 0172	+0.423 0386	+ 847	+0.186 5543	+0.183 5272	+ 224		
27	0.902 6203	0.906 3118	442	0.416 0293	0.408 9899	857	0.180 4868	0.177 4333	233		
28	0.909 9385	0.913 4999	429	0.401 9207	0.394 8223	866	0.174 3668	0.171 2877	241		
29	0.916 9958	0.920 4257	416	0.387 6951	0.380 5397	876	0.168 1960	0.165 0920	250		
30	0.923 7893	0.927 0865	403	0.373 3565	0.366 1461	885	0.161 9760	0.158 8481	259		
31	-0.930 3168	-0.933 4800	+ 389	+0.358 9090	+0.351 6457	+ 894	+0.155 7086	+0.152 5578	+ 267		
Sept. 1	0.936 5757	0.939 6037	375	0.344 3568	0.337 0429	903	0.149 3958	0.146 2229	276		
2	0.942 5637	0.945 4554	361	0.329 7044	0.322 3419	912	0.143 0393	0.139 8453	284		
3	0.948 2785	0.951 0329	347	0.314 9560	0.307 5472	920	0.136 6411	0.133 4269	293		
4	0.953 7183	0.956 3345	333	0.300 1162	0.292 6634	928	0.130 2030	0.126 9697	301		
5	-0.958 8812	-0.961 3583	+ 318	+0.285 1896	+0.277 6952	+ 936	+0.123 7271	+0.120 4756	+ 309		
6	0.963 7656	0.966 1028	303	0.270 1807	0.262 6469	944	0.117 2154	0.113 9468	317		
7	0.968 3698	0.970 5664	288	0.255 0942	0.247 5232	951	0.110 6699	0.107 3851	325		
8	0.972 6925	0.974 7478	272	0.239 9345	0.232 3287	959	0.104 0925	0.100 7925	333		
9	0.976 7323	0.978 6458	256	0.224 7062	0.217 0677	965	0.097 4853	0.094 1712	341		
10	-0.980 4882	-0.982 2593	+ 239	+0.209 4137	+0.201 7449	+ 972	+0.090 8504	+0.087 5232	+ 349		
11	0.983 9590	0.985 5872	222	0.194 0617	0.186 3648	978	0.084 1897	0.080 8503	357		
12	0.987 1438	0.988 6287	206	0.178 6547	0.170 9319	984	0.077 5052	0.074 1546	365		
13	0.990 0417	0.991 3828	189	0.163 1971	0.155 4507	990	0.070 7988	0.067 4380	373		
14	0.992 6519	0.993 8490	172	0.147 6934	0.139 9257	995	0.064 0725	0.060 7025	381		
15	-0.994 9739	-0.996 0266	+ 154	+0.132 1481	+0.124 3612	+ 1000	+0.057 3283	+0.053 9500	+ 389		
16	0.997 0071	0.997 9152	137	0.116 5655	0.108 7616	1005	0.050 5680	0.047 1825	397		
17	0.998 7509	0.999 5141	120	0.100 9499	0.093 1311	1009	0.043 7936	0.040 4016	404		
18	1.000 2047	1.000 8228	102	0.085 3056	0.077 4740	1013	0.037 0068	0.033 6094	411		
19	1.001 3682	1.001 8410	84	0.069 6367	0.061 7943	1017	0.030 2096	0.026 8076	419		
20	-1.002 2411	-1.002 5684	+ 65	+0.053 9474	+0.046 0965	+ 1021	+0.023 4037	+0.019 9980	+ 426		
21	1.002 8228	1.003 0042	46	0.038 2420	0.030 3845	1024	0.016 5909	0.013 1824	433		
22	1.003 1126	1.003 1478	27	0.022 5246	+0.014 6627	1026	0.009 7729	+0.006 3626	440		
23	1.003 1098	1.002 9985	+ 8	+0.006 7994	-0.001 0647	1029	+0.002 9516	-0.000 4597	447		
24	1.002 8138	1.002 5557	- 11	-0.008 9292	0.016 7934	1032	-0.003 8712	0.007 2826	453		
25	-1.002 2241	-1.001 8190	- 31	-0.024 6568	-0.032 5187	+ 1034	-0.010 6936	-0.014 1041	+ 459		
26	1.001 3403	1.000 7880	50	0.040 3786	0.048 2359	1036	0.017 5137	0.020 9222	466		
27	1.000 1620	0.999 4623	70	0.056 0900	0.063 9404	1037	0.024 3294	0.027 7350	472		
28	0.998 6888	0.997 8415	90	0.071 7864	0.079 6274	1038	0.031 1387	0.034 5403	478		
29	0.996 9205	0.995 9258	110	0.087 4628	0.095 2920	1038	0.037 9395	0.041 3360	484		
30	-0.994 8573	-0.993 7152	- 130	-0.103 1143	-0.110 9292	+ 1039	-0.044 7296	-0.048 1201	+ 490		
Oct. 1	-0.992 4995	-0.991 2101	- 150	-0.118 7360	-0.126 5342	+ 1039	-0.051 5070	-0.054 8903	+ 495		

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.	
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.		
Oct.	1	-0.992 4995	-0.991 2101	- 150	-0.118 7360	-0.126 5342	+ 1039	-0.051 5070	-0.054 8903	+ 495
	2	0.989 8471	0.988 4106	171	0.134 3230	0.142 1019	1039	0.058 2695	0.061 6444	501
	3	0.986 9007	0.985 3175	191	0.149 8702	0.157 6273	1038	0.065 0148	0.068 3803	507
	4	0.983 6611	0.981 9315	212	0.165 3727	0.173 1057	1038	0.071 7408	0.075 0959	512
	5	0.980 1290	0.978 2536	233	0.180 8258	0.188 5324	1037	0.078 4454	0.081 7891	517
	6	-0.976 3055	-0.974 2848	- 254	-0.196 2248	-0.203 9024	+ 1035	-0.085 1267	-0.088 4578	+ 521
	7	0.972 1916	0.970 0262	274	0.211 5646	0.219 2108	1033	0.091 7822	0.095 0996	526
	8	0.967 7886	0.965 4790	295	0.226 8404	0.234 4528	1031	0.098 4099	0.101 7127	531
	9	0.963 0977	0.960 6448	316	0.242 0475	0.249 6239	1029	0.105 0078	0.108 2950	535
	10	0.958 1205	0.955 5250	338	0.257 1814	0.264 7194	1026	0.111 5739	0.114 8443	540
	11	-0.952 8584	-0.950 1210	- 359	-0.272 2374	-0.279 7348	+ 1023	-0.118 1060	-0.121 3587	+ 544
	12	0.947 3130	0.944 4346	381	0.287 2111	0.294 6657	1019	0.124 6022	0.127 8363	548
	13	0.941 4861	0.938 4677	402	0.302 0981	0.309 5077	1015	0.131 0608	0.134 2753	551
	14	0.935 3796	0.932 2220	424	0.316 8940	0.324 2564	1011	0.137 4796	0.140 6736	555
	15	0.928 9952	0.925 6994	446	0.331 5944	0.338 9075	1007	0.143 8569	0.147 0294	558
	16	-0.922 3349	-0.918 9019	- 468	-0.346 1952	-0.353 4570	+ 1002	-0.150 1908	-0.153 3410	+ 561
	17	0.915 4006	0.911 8313	490	0.360 6923	0.367 9007	997	0.156 4797	0.159 6066	564
	18	0.908 1942	0.904 4895	512	0.375 0816	0.382 2347	992	0.162 7216	0.165 8244	567
	19	0.900 7174	0.896 8782	533	0.389 3594	0.396 4552	986	0.168 9149	0.171 9929	570
	20	0.892 9722	0.888 9995	555	0.403 5216	0.410 5581	980	0.175 0582	0.178 1105	572
	21	-0.884 9603	-0.880 8548	- 577	-0.417 5641	-0.424 5391	+ 974	-0.181 1496	-0.184 1752	+ 574
	22	0.876 6833	0.872 4459	599	0.431 4827	0.438 3943	968	0.187 1872	0.190 1853	576
	23	0.868 1430	0.863 7747	620	0.445 2733	0.452 1192	961	0.193 1693	0.196 1390	578
	24	0.859 3414	0.854 8433	642	0.458 9315	0.465 7096	953	0.199 0942	0.202 0346	579
	25	0.850 2806	0.845 6537	664	0.472 4530	0.479 1612	945	0.204 9600	0.207 8701	580
	26	-0.840 9628	-0.836 2082	- 687	-0.485 8336	-0.492 4696	+ 937	-0.210 7647	-0.213 6435	+ 581
	27	0.831 3902	0.826 5091	710	0.499 0686	0.505 6301	928	0.216 5063	0.219 3529	582
	28	0.821 5653	0.816 5591	732	0.512 1536	0.518 6386	920	0.222 1831	0.224 9966	583
	29	0.811 4909	0.806 3609	754	0.525 0845	0.531 4907	912	0.227 7932	0.230 5726	583
	30	0.801 1696	0.795 9173	776	0.537 8567	0.544 1819	903	0.233 3346	0.236 0788	583
	31	-0.790 6045	-0.785 2315	- 798	-0.550 4659	-0.556 7080	+ 893	-0.238 8052	-0.241 5135	+ 583
Nov.	1	0.779 7988	0.774 3067	820	0.562 9079	0.569 0650	884	0.244 2035	0.246 8750	583
	2	0.768 7556	0.763 1460	843	0.575 1788	0.581 2487	874	0.249 5278	0.252 1615	582
	3	0.757 4782	0.751 7528	865	0.587 2743	0.593 2552	864	0.254 7760	0.257 3710	581
	4	0.745 9702	0.740 1308	887	0.599 1908	0.605 0806	853	0.259 9463	0.262 5017	580
	5	-0.734 2352	-0.728 2837	- 909	-0.610 9241	-0.616 7209	+ 842	-0.265 0370	-0.267 5520	+ 579
	6	0.722 2769	0.716 2152	931	0.622 4705	0.628 1724	830	0.270 0465	0.272 5203	577
	7	0.710 0990	0.703 9289	953	0.633 8262	0.639 4315	818	0.274 9733	0.277 4052	576
	8	0.697 7053	0.691 4288	975	0.644 9878	0.650 4946	806	0.279 8158	0.282 2049	574
	9	0.685 0999	0.678 7190	997	0.655 9516	0.661 3584	793	0.284 5724	0.286 9180	572
	10	-0.672 2866	-0.665 8033	- 1019	-0.666 7145	-0.672 0196	+ 780	-0.289 2416	-0.291 5430	+ 569
	11	0.659 2695	0.652 6858	1041	0.677 2733	0.682 4752	767	0.293 8221	0.296 0786	567
	12	0.646 0527	0.639 3706	1063	0.687 6248	0.692 7218	753	0.298 3124	0.300 5234	564
	13	0.632 6402	0.625 8619	1084	0.697 7659	0.702 7567	738	0.302 7114	0.304 8762	561
	14	0.619 0363	0.612 1637	1105	0.707 6938	0.712 5770	724	0.307 0178	0.309 1359	557
	15	-0.605 2447	-0.598 2799	- 1125	-0.717 4059	-0.722 1801	+ 709	-0.311 2304	-0.313 3012	+ 554
	16	0.591 2696	0.584 2144	- 1145	-0.726 8993	-0.731 5631	+ 693	-0.315 3482	-0.317 3711	+ 550



## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	Midnight.		Noon.	Midnight.		Noon.	Midnight.	
Nov. 16	-0.591 2696	-0.584 2144	-1145	-0.726 8993	-0.731 5631	+693	-0.315 3482	-0.317 3711	+550
17	0.577 1147	0.569 9709	1166	0.736 1713	0.740 7234	678	0.319 3699	0.321 3444	546
18	0.562 7836	0.555 5534	1187	0.745 2192	0.749 6583	662	0.323 2944	0.325 2198	542
19	0.548 2807	0.540 9659	1207	0.754 0403	0.758 3649	646	0.327 1205	0.328 9963	537
20	0.533 6095	0.526 2121	1228	0.762 6316	0.766 8402	629	0.330 8471	0.332 6727	532
21	-0.518 7741	-0.511 2960	-1248	-0.770 9904	-0.775 0817	+612	-0.334 4730	-0.336 2478	+527
22	0.503 7784	0.496 2218	1268	0.779 1137	0.783 0861	595	0.337 9969	0.339 7202	522
23	0.488 6267	0.480 9936	1289	0.786 9986	0.790 8507	578	0.341 4175	0.343 0887	516
24	0.473 3232	0.465 6161	1310	0.794 6422	0.798 3726	560	0.344 7336	0.346 3520	510
25	0.457 8727	0.450 0937	1330	0.802 0417	0.805 6491	541	0.347 9439	0.349 5090	504
26	-0.442 2797	-0.434 4312	-1350	-0.809 1945	-0.812 6775	+521	-0.351 0473	-0.352 5586	+498
27	0.426 5488	0.418 6332	1370	0.816 0978	0.819 4552	502	0.354 0427	0.355 4995	491
28	0.410 6850	0.402 7048	1389	0.822 7493	0.825 9798	483	0.356 9288	0.358 3306	484
29	0.394 6933	0.386 6511	1409	0.829 1464	0.832 2488	463	0.359 7047	0.361 0509	477
30	0.378 5788	0.370 4771	1427	0.835 2867	0.838 2599	442	0.362 3692	0.363 6594	470
Dec. 1	-0.362 3466	-0.354 1879	-1444	-0.841 1682	-0.844 0112	+421	-0.364 9214	-0.366 1551	+463
2	0.346 0017	0.337 7887	1461	0.846 7887	0.849 5005	400	0.367 3604	0.368 5371	455
3	0.329 5496	0.321 2850	1477	0.852 1464	0.854 7261	378	0.369 6852	0.370 8046	446
4	0.312 9956	0.304 6820	1493	0.857 2393	0.859 6859	356	0.371 8951	0.372 9567	438
5	0.296 3450	0.287 9852	1509	0.862 0657	0.864 3786	333	0.373 9893	0.374 9928	429
6	-0.279 6034	-0.271 2001	-1525	-0.866 6243	-0.868 8027	+310	-0.375 9671	-0.376 9122	+420
7	0.262 7761	0.254 3320	1541	0.870 9136	0.872 9568	287	0.377 8279	0.378 7143	411
8	0.245 8686	0.237 3865	1557	0.874 9323	0.876 8398	264	0.379 5712	0.380 3986	402
9	0.228 8864	0.220 3689	1573	0.878 6793	0.880 4506	240	0.381 1965	0.381 7647	393
10	0.211 8348	0.203 2847	1589	0.882 1536	0.883 7882	215	0.382 7033	0.383 4122	384
11	-0.194 7193	-0.186 1392	-1604	-0.885 3543	-0.886 8519	+191	-0.384 0914	-0.384 7408	+374
12	0.177 5451	0.168 9377	1618	0.888 2808	0.889 6410	166	0.385 3604	0.385 9502	365
13	0.160 3175	0.151 6853	1633	0.890 9325	0.892 1551	141	0.386 5101	0.387 0402	355
14	0.143 0416	0.134 3870	1647	0.893 3089	0.894 3937	115	0.387 5403	0.388 0105	344
15	0.125 7222	0.117 0479	1660	0.895 4094	0.896 3560	89	0.388 4507	0.388 8610	333
16	-0.108 3646	-0.099 6730	-1672	-0.897 2333	-0.898 0414	+63	-0.389 2413	-0.389 5916	+323
17	0.090 9736	0.082 2671	1684	0.898 7801	0.899 4495	36	0.389 9119	0.390 2021	312
18	0.073 5540	0.064 8350	1695	0.900 0494	0.900 5798	+9	0.390 4622	0.390 6921	301
19	0.056 1108	0.047 3819	1706	0.901 0405	0.901 4315	-19	0.390 8919	0.391 0615	289
20	0.038 6490	0.029 9128	1716	0.901 7528	0.902 0042	47	0.391 2009	0.391 3100	278
21	-0.021 1739	-0.012 4330	-1726	-0.902 1856	-0.902 2971	-75	-0.391 3888	-0.391 4373	+266
22	-0.003 6907	+0.005 0523	1736	0.902 3385	0.902 3098	103	0.391 4554	0.391 4431	254
23	+0.013 7953	0.022 5376	1745	0.902 2110	0.902 0420	132	0.391 4005	0.391 3275	242
24	0.031 2785	0.040 0173	1754	0.901 8028	0.901 4934	161	0.391 2240	0.391 0901	230
25	0.048 7534	0.057 4861	1763	0.901 1137	0.900 6638	190	0.390 9257	0.390 7308	217
26	+0.066 2146	+0.074 9383	-1771	-0.900 1436	-0.899 5533	-219	-0.390 5055	-0.390 2497	+205
27	0.083 6564	0.092 3682	1778	0.898 8927	0.898 1619	248	0.389 9635	0.389 6468	192
28	0.101 0730	0.109 7702	1785	0.897 3610	0.896 4899	277	0.389 2997	0.388 9222	179
29	0.118 4590	0.127 1387	1791	0.895 5488	0.894 5377	307	0.388 5143	0.388 0759	165
30	0.135 8085	0.144 4678	1796	0.893 4567	0.892 3058	338	0.387 6072	0.387 1082	152
31	+0.153 1158	+0.161 7519	-1800	-0.891 0851	-0.889 7948	-368	-0.386 5789	-0.386 0194	+138
32	+0.170 3753	+0.178 9853	-1804	-0.888 4349	-0.887 0055	-399	-0.385 4296	-0.384 8097	+125

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		Day of Month.	FEBRUARY.		Day of Month.	MARCH.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	167 36 46.2	+ 5 6 51.8	1.0	211 12 23.6	+ 2 49 1.2	1.0	219 12 39.3	+ 1 56 15.0
1.5	173 40 30.8	4 59 3.6	1.5	217 6 47.5	2 22 0.2	1.5	225 6 27.8	1 26 52.3
2.0	179 41 15.4	4 48 1.1	2.0	223 1 50.9	1 53 24.1	2.0	231 0 52.1	0 56 29.0
2.5	185 39 34.8	4 33 54.6	2.5	228 58 15.0	1 23 27.6	2.5	236 56 30.5	+ 0 25 21.2
3.0	191 36 5.4	4 16 55.2	3.0	234 56 41.6	0 52 26.2	3.0	242 54 3.1	- 0 6 14.4
3.5	197 31 24.8	+ 3 57 14.1	3.5	240 57 52.0	+ 0 20 36.4	3.5	248 54 11.1	- 0 38 0.1
4.0	203 26 11.7	3 35 2.9	4.0	247 2 26.2	- 0 11 44.3	4.0	254 57 36.1	1 9 37.7
4.5	209 21 5.2	3 10 33.4	4.5	253 11 2.5	0 44 16.7	4.5	261 4 59.9	1 40 47.7
5.0	215 16 44.0	2 43 58.3	5.0	259 24 16.2	1 16 39.9	5.0	267 17 2.9	2 11 9.5
5.5	221 13 45.6	2 15 31.1	5.5	265 42 38.8	1 48 31.5	5.5	273 34 23.6	2 40 21.2
6.0	227 12 46.1	+ 1 45 26.3	6.0	272 6 36.9	- 2 19 27.2	6.0	279 57 36.9	- 3 7 59.1
6.5	233 14 19.8	1 13 59.4	6.5	278 36 31.0	2 49 0.8	6.5	286 27 13.1	3 33 38.1
7.0	239 18 58.7	0 41 27.7	7.0	285 12 34.4	3 16 44.4	7.0	293 3 36.6	3 56 52.0
7.5	245 27 11.5	+ 0 8 10.1	7.5	291 54 52.1	3 42 9.3	7.5	299 47 3.9	4 17 13.7
8.0	251 39 23.0	- 0 25 32.7	8.0	298 43 20.1	4 4 46.7	8.0	306 37 42.0	4 34 16.3
8.5	257 55 53.6	- 0 59 18.0	8.5	305 37 45.2	- 4 24 7.9	8.5	313 35 27.6	- 4 47 33.5
9.0	264 16 59.3	1 32 41.3	9.0	312 37 44.2	4 39 46.1	9.0	320 40 5.6	4 56 40.6
9.5	270 42 50.5	2 5 16.3	9.5	319 42 44.6	4 51 17.4	9.5	327 51 8.8	5 1 16.2
10.0	277 13 31.7	2 36 35.4	10.0	326 52 5.8	4 58 21.9	10.0	335 7 58.3	5 1 3.6
10.5	283 49 1.4	3 6 9.8	10.5	334 5 0.4	5 0 44.7	10.5	342 29 43.7	4 55 52.4
11.0	290 29 12.3	- 3 33 30.6	11.0	341 20 35.6	- 4 58 17.5	11.0	349 55 24.4	- 4 45 39.3
11.5	297 13 51.3	3 58 9.4	11.5	348 37 56.3	4 50 58.7	11.5	357 23 52.9	4 30 29.0
12.0	304 2 39.9	4 19 38.9	12.0	355 56 7.1	4 38 53.4	12.0	4 53 57.8	4 10 34.6
12.5	310 55 15.1	4 37 34.0	12.5	3 14 14.7	4 22 13.9	12.5	12 24 26.4	3 46 17.5
13.0	317 51 9.7	4 51 32.6	13.0	10 31 30.4	4 1 18.8	13.0	19 54 8.2	3 18 6.2
13.5	324 49 54.0	- 5 1 16.6	13.5	17 47 11.3	- 3 36 32.3	13.5	27 21 58.3	- 2 46 35.4
14.0	331 50 56.8	5 6 32.4	14.0	25 0 41.6	3 8 23.0	14.0	34 46 59.1	2 12 23.9
14.5	338 53 46.7	5 7 11.1	14.5	32 11 33.5	2 37 22.7	14.5	42 8 22.4	1 36 13.3
15.0	345 57 53.7	5 3 9.4	15.0	39 19 26.6	2 4 5.5	15.0	49 25 30.5	0 58 46.2
15.5	353 2 49.5	4 54 29.3	15.5	46 24 7.8	1 29 6.6	15.5	56 37 56.2	- 0 20 44.3
16.0	0 8 8.4	- 4 41 18.0	16.0	53 25 30.5	- 0 53 1.6	16.0	63 45 21.9	+ 0 17 12.9
16.5	7 13 28.3	4 23 47.8	16.5	60 23 33.3	- 0 16 25.8	16.5	70 47 38.8	0 54 28.3
17.0	14 18 30.9	4 2 15.4	17.0	67 18 18.1	+ 0 20 7.0	17.0	77 44 46.6	1 30 28.3
17.5	21 23 1.3	3 37 1.8	17.5	74 9 50.6	0 56 4.7	17.5	84 36 50.9	2 4 43.2
18.0	28 26 47.7	3 8 31.8	18.0	80 58 17.4	1 30 56.9	18.0	91 24 1.9	2 36 47.1
18.5	35 29 40.7	- 2 37 12.9	18.5	87 43 45.6	+ 2 4 15.3	18.5	98 6 32.8	+ 3 6 17.9
19.0	42 31 33.2	2 3 35.3	19.0	94 26 21.9	2 35 33.9	19.0	104 44 39.5	3 32 57.1
19.5	49 32 19.0	1 28 11.4	19.5	101 6 11.7	3 4 29.5	19.5	111 18 38.8	3 56 29.5
20.0	56 31 52.5	0 51 34.9	20.0	107 43 19.1	3 30 41.5	20.0	117 48 47.3	4 16 42.7
20.5	63 30 7.0	- 0 14 20.5	20.5	114 17 46.2	3 53 52.3	20.5	124 15 21.0	4 33 27.4
21.0	70 26 54.4	+ 0 22 57.1	21.0	120 49 33.2	+ 4 13 47.3	21.0	130 38 35.1	+ 4 46 37.0
21.5	77 22 5.5	0 59 43.6	21.5	127 18 38.5	4 30 14.9	21.5	136 58 43.3	4 56 7.7
22.0	84 15 29.5	1 35 25.6	22.0	133 44 59.4	4 43 6.8	22.0	143 15 57.4	5 1 57.9
22.5	91 6 53.2	2 9 31.3	22.5	140 8 32.3	4 52 17.9	22.5	149 30 27.9	5 4 8.2
23.0	97 56 1.5	2 41 31.2	23.0	146 29 13.7	4 57 46.2	23.0	155 42 24.4	5 2 41.6
23.5	104 42 37.8	+ 3 10 58.8	23.5	152 47 0.4	+ 4 59 32.6	23.5	161 51 55.1	+ 4 57 43.3
24.0	111 26 24.9	3 37 31.3	24.0	159 1 50.3	4 57 40.9	24.0	167 59 7.4	4 49 20.3
24.5	118 7 5.9	4 0 49.4	24.5	165 13 43.5	4 52 17.4	24.5	174 4 8.5	4 37 41.5
25.0	124 44 24.6	4 20 38.1	25.0	171 22 42.4	4 43 30.6	25.0	180 7 6.2	4 22 57.5
25.5	131 18 6.3	4 36 46.7	25.5	177 28 52.2	4 31 30.9	25.5	186 8 8.5	4 5 20.3
26.0	137 47 59.1	+ 4 49 8.3	26.0	183 32 21.3	+ 4 16 30.2	26.0	192 7 24.7	+ 3 45 3.6
26.5	144 13 54.9	4 57 40.0	26.5	189 33 21.9	3 58 41.8	26.5	198 5 5.6	3 22 22.0
27.0	150 35 49.2	5 2 22.4	27.0	195 32 9.9	3 38 19.7	27.0	204 1 23.9	2 57 31.1
27.5	156 53 41.9	5 3 19.4	27.5	201 29 4.6	3 15 38.8	27.5	209 56 34.6	2 30 47.0
28.0	163 7 38.0	5 0 37.6	28.0	207 24 29.3	2 50 54.2	28.0	215 50 55.0	2 2 26.5
28.5	169 17 47.2	+ 4 54 25.4	28.5	213 18 50.8	+ 2 24 21.0	28.5	221 44 45.0	+ 1 32 46.7
29.0	175 24 23.9	4 44 52.9	29.0	219 12 39.3	1 56 15.0	29.0	227 38 27.1	1 2 5.1
29.5	181 27 47.3	4 32 11.7	29.5	225 6 27.8	1 26 52.3	29.5	233 32 26.7	+ 0 30 39.6
30.0	187 28 21.2	4 16 34.1	30.0	231 0 52.1	0 56 29.0	30.0	239 27 11.7	- 0 1 12.0
30.5	193 26 33.2	3 58 12.9	30.5	236 56 30.5	+ 0 25 21.2	30.5	245 23 12.7	0 33 11.7
31.0	199 22 54.4	+ 3 37 21.4	31.0	242 54 3.1	- 0 6 14.4	31.0	251 21 2.5	- 1 5 1.2
31.5	205 17 58.9	+ 3 14 12.9	31.5	248 54 11.1	- 0 38 0.1	31.5	257 21 15.9	- 1 36 21.5

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	APRIL.		Day of Month.	MAY.		Day of Month.	JUNE.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	263 24 29.2	-2 6 53.5	1.0	297 26 42.7	-4 31 45.3	1.0	347 21 26.0	-4 59 27.7
1.5	269 31 19.7	2 36 17.4	1.5	303 53 30.6	4 48 13.0	1.5	354 20 19.0	4 44 39.1
2.0	275 42 25.6	3 4 12.7	2.0	310 25 53.3	5 1 12.0	2.0	1 24 13.5	4 25 22.6
2.5	281 58 23.7	3 30 17.9	2.5	317 4 13.2	5 10 23.2	2.5	8 32 59.9	4 1 47.1
3.0	288 19 49.9	3 54 10.8	3.0	323 48 48.5	5 15 28.5	3.0	15 46 21.7	3 34 7.2
3.5	294 47 17.5	-4 15 28.3	3.5	330 39 52.3	-5 16 11.6	3.5	23 3 55.3	-3 2 43.6
4.0	301 21 15.7	4 33 46.9	4.0	337 37 30.6	5 12 19.1	4.0	30 25 9.0	2 28 3.5
4.5	308 2 8.1	4 48 42.7	4.5	344 41 40.8	5 3 41.3	4.5	37 49 24.1	1 50 40.7
5.0	314 50 11.5	4 59 52.3	5.0	351 52 11.7	4 50 13.1	5.0	45 15 54.7	1 11 14.4
5.5	321 45 34.2	5 6 53.4	5.5	359 8 42.1	4 31 55.2	5.5	52 43 48.8	-0 30 28.3
6.0	328 48 14.0	-5 9 26.0	6.0	6 30 39.4	-4 8 55.4	6.0	60 12 9.4	+0 10 50.9
6.5	335 57 57.4	5 7 13.5	6.5	13 57 21.0	3 41 28.9	6.5	67 39 57.0	0 51 54.7
7.0	343 14 18.5	5 0 3.8	7.0	21 27 54.5	3 9 59.2	7.0	75 6 11.1	1 31 55.4
7.5	350 36 39.0	4 47 51.6	7.5	29 1 19.1	2 34 57.8	7.5	82 29 52.4	2 10 7.7
8.0	358 4 8.3	4 30 38.8	8.0	36 36 27.4	1 57 3.5	8.0	89 50 4.7	2 45 50.9
8.5	5 35 45.3	-4 8 35.6	8.5	44 12 8.1	-1 17 0.8	8.5	97 5 57.5	+3 18 29.7
9.0	13 10 20.4	3 42 0.9	9.0	51 47 8.6	-0 35 38.8	9.0	104 16 47.0	3 47 35.2
9.5	20 46 38.0	3 11 22.6	9.5	59 20 17.6	+0 6 11.7	9.5	111 21 57.7	4 12 45.7
10.0	28 23 19.8	2 37 16.3	10.0	66 50 28.3	0 47 40.0	10.0	118 21 3.1	4 33 46.3
10.5	35 59 8.7	2 0 23.7	10.5	74 16 40.3	1 27 58.0	10.5	125 13 46.1	4 50 28.4
11.0	43 32 51.5	-1 21 31.3	11.0	81 38 1.6	+2 6 21.7	11.0	131 59 58.7	+5 2 49.3
11.5	51 3 22.0	0 41 27.6	11.5	88 53 49.6	2 42 12.9	11.5	138 39 41.4	5 10 51.1
12.0	58 29 42.7	-0 1 1.1	12.0	96 3 32.3	3 15 0.0	12.0	145 13 3.0	5 14 39.9
12.5	65 51 6.6	+0 39 1.8	12.5	103 6 47.8	3 44 18.2	12.5	151 40 18.9	5 14 24.5
13.0	73 6 58.1	1 17 58.1	13.0	110 3 24.3	4 9 49.0	13.0	158 1 50.8	5 10 16.2
13.5	80 16 52.5	+1 55 9.5	13.5	116 53 19.1	+4 31 20.3	13.5	164 18 4.9	+5 2 27.8
14.0	87 20 35.3	2 30 3.1	14.0	123 36 37.8	4 48 45.3	14.0	170 29 31.0	4 51 12.9
14.5	94 18 1.4	3 2 11.7	14.5	130 13 33.1	5 2 1.7	14.5	176 36 41.9	4 36 45.7
15.0	101 9 14.1	3 31 13.6	15.0	136 44 23.0	5 11 11.1	15.0	182 40 12.4	4 19 20.9
15.5	107 54 23.0	3 56 52.3	15.5	143 9 30.3	5 16 17.9	15.5	188 40 38.3	3 59 13.4
16.0	114 33 43.0	+4 18 55.6	16.0	149 29 21.2	+5 17 28.7	16.0	194 38 35.7	+3 36 38.0
16.5	121 7 33.1	4 37 15.2	16.5	155 44 24.4	5 14 51.8	16.5	200 34 40.7	3 11 49.5
17.0	127 36 15.0	4 51 46.7	17.0	161 55 9.7	5 8 37.1	17.0	206 29 28.6	2 45 3.4
17.5	134 0 11.9	5 2 28.4	17.5	168 2 7.9	4 58 55.2	17.5	212 23 33.5	2 16 35.4
18.0	140 19 47.8	5 9 20.9	18.0	174 5 50.0	4 45 57.5	18.0	218 17 28.2	1 46 41.4
18.5	146 35 27.0	+5 12 26.8	18.5	180 6 46.4	+4 29 56.2	18.5	224 11 43.7	+1 15 38.0
19.0	152 47 33.3	5 11 50.6	19.0	186 5 26.7	4 11 4.0	19.0	230 6 48.9	0 43 42.6
19.5	158 56 29.6	5 7 38.4	19.5	192 2 19.3	3 49 34.4	19.5	236 3 10.2	+0 11 13.4
20.0	165 2 37.7	4 59 57.8	20.0	197 57 51.3	3 25 41.4	20.0	242 1 11.7	-0 21 30.6
20.5	171 6 18.1	4 48 57.8	20.5	203 52 28.4	2 59 39.7	20.5	248 1 15.0	0 54 9.7
21.0	177 7 50.3	+4 34 48.5	21.0	209 46 34.6	+2 31 44.8	21.0	254 3 39.0	-1 26 23.1
21.5	183 7 32.2	4 17 41.1	21.5	215 40 32.3	2 2 13.0	21.5	260 8 39.7	1 57 49.3
22.0	189 5 40.6	3 57 48.1	22.0	221 34 42.6	1 31 21.5	22.0	266 16 30.7	2 28 6.4
22.5	195 2 31.5	3 35 23.2	22.5	227 29 24.9	0 59 28.2	22.5	272 27 22.9	2 56 52.2
23.0	200 58 20.3	3 10 41.2	23.0	233 24 57.5	+0 26 51.9	23.0	278 41 24.8	3 23 44.6
23.5	206 53 22.2	+2 43 57.6	23.5	239 21 37.5	-0 6 8.0	23.5	284 58 42.5	-3 48 21.2
24.0	212 47 52.1	2 15 28.8	24.0	245 19 41.2	0 39 11.3	24.0	291 19 20.2	4 10 20.7
24.5	218 42 5.0	1 45 32.4	24.5	251 19 24.2	1 11 57.3	24.5	297 43 20.5	4 29 23.0
25.0	224 36 16.5	1 14 26.3	25.0	257 21 1.4	1 44 5.1	25.0	304 10 44.3	4 45 9.3
25.5	230 30 43.2	0 42 29.1	25.5	263 24 47.4	2 15 13.3	25.5	310 41 31.5	4 57 22.5
26.0	236 25 42.6	+0 9 59.8	26.0	269 30 56.8	-2 45 0.4	26.0	317 15 41.5	-5 5 47.7
26.5	242 21 33.6	-0 22 42.2	26.5	275 39 44.3	3 13 5.3	26.5	323 53 13.3	5 10 12.6
27.0	248 18 36.4	0 55 17.3	27.0	281 51 24.7	3 39 7.0	27.0	330 34 5.5	5 10 27.9
27.5	254 17 12.7	1 27 25.7	27.5	288 6 13.1	4 2 45.0	27.5	337 18 16.6	5 6 27.1
28.0	260 17 45.9	1 58 47.4	28.0	294 24 24.7	4 23 39.6	28.0	344 5 45.3	4 58 7.5
28.5	266 20 41.0	-2 29 2.3	28.5	300 46 15.1	-4 41 31.5	28.5	350 56 29.9	-4 45 30.0
29.0	272 26 24.3	2 57 50.2	29.0	307 11 59.9	4 56 2.7	29.0	357 50 28.4	4 28 39.3
29.5	278 35 23.6	3 24 50.8	29.5	313 41 54.3	5 6 56.5	29.5	4 47 38.3	4 7 44.2
30.0	284 48 7.3	3 49 43.8	30.0	320 16 13.0	5 13 57.8	30.0	11 47 55.4	3 42 58.1
30.5	291 5 4.1	4 12 8.8	30.5	326 55 9.3	5 16 53.3	30.5	18 51 14.3	3 14 38.6
31.0	297 26 42.7	-4 31 45.3	31.0	333 38 54.7	-5 15 31.8	31.0	25 57 28.1	-2 43 8.0
31.5	303 53 30.6	-4 48 13.0	31.5	340 27 38.4	-5 9 44.9	31.5	33 6 28.1	-2 8 53.1

FOR GREENWICH MEAN NOON AND MIDNIGHT.								
Day of Month.	JULY.		Day of Month.	AUGUST.		Day of Month.	SEPTEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	25 57 26.3	- 2 43 8.0	1.0	79 17 17.7	+ 2 2 13.1	1.0	130 45 14.9	+ 4 55 23.6
1.5	33 6 20.0	2 8 53.1	1.5	86 21 45.4	2 35 28.9	1.5	137 24 54.9	5 0 24.5
2.0	40 17 39.8	1 32 24.9	2.0	93 25 14.6	3 6 14.4	2.0	144 1 22.6	5 1 20.3
2.5	47 31 5.8	0 54 18.5	2.5	100 27 19.2	3 34 1.0	2.5	150 34 25.5	4 58 16.0
3.0	54 46 12.9	- 0 15 12.0	3.0	107 27 30.7	3 58 23.9	3.0	157 3 52.8	4 51 20.3
3.5	62 2 30.9	+ 0 24 13.8	3.5	114 25 19.1	+ 4 19 2.9	3.5	163 29 36.2	+ 4 40 44.8
4.0	69 19 24.7	1 3 16.9	4.0	121 20 14.2	4 35 42.9	4.0	169 51 30.2	4 26 43.6
4.5	76 36 14.9	1 41 15.3	4.5	128 11 46.8	4 48 13.8	4.5	176 9 33.4	4 9 33.0
5.0	83 52 18.4	2 17 28.1	5.0	134 59 29.7	4 56 30.7	5.0	182 23 48.3	3 49 30.7
5.5	91 6 49.9	2 51 17.1	5.5	141 42 59.4	5 0 33.7	5.5	188 34 21.7	3 26 55.6
6.0	98 19 3.2	+ 3 22 8.5	6.0	148 21 57.1	+ 5 0 27.6	6.0	194 41 24.9	+ 3 2 7.0
6.5	105 28 13.2	3 49 33.4	6.5	154 56 9.1	4 56 20.9	6.5	200 45 13.5	2 35 24.6
7.0	112 33 37.4	4 13 8.7	7.0	161 25 28.0	4 48 25.6	7.0	206 46 7.5	2 7 7.8
7.5	119 34 37.6	4 32 37.5	7.5	167 49 52.5	4 36 56.0	7.5	212 44 30.8	1 37 36.0
8.0	126 30 41.4	4 47 49.2	8.0	174 9 27.5	4 22 8.6	8.0	218 40 50.8	1 7 8.0
8.5	133 21 23.2	+ 4 58 39.4	8.5	180 24 24.4	+ 4 4 21.0	8.5	224 35 38.7	+ 0 36 2.1
9.0	140 6 25.0	5 5 9.0	9.0	186 35 0.3	3 43 51.5	9.0	230 29 28.1	+ 0 4 36.2
9.5	146 45 36.6	5 7 23.4	9.5	192 41 37.4	3 20 58.7	9.5	236 22 55.2	- 0 26 52.4
10.0	153 18 56.4	5 5 31.8	10.0	198 44 42.4	2 56 1.0	10.0	242 16 38.4	0 58 6.3
10.5	159 46 30.1	4 59 46.5	10.5	204 44 46.4	2 29 16.7	10.5	248 11 17.4	1 28 48.4
11.0	166 8 30.1	+ 4 50 21.8	11.0	210 42 23.7	+ 2 1 3.5	11.0	254 7 32.9	- 1 58 41.6
11.5	172 25 15.6	4 37 33.3	11.5	216 38 11.3	1 31 38.9	11.5	260 6 5.9	2 27 28.3
12.0	178 37 11.3	4 21 37.5	12.0	222 32 48.2	1 1 20.0	12.0	266 7 37.1	2 54 50.8
12.5	184 44 46.5	4 2 51.3	12.5	228 26 54.8	+ 0 30 23.7	12.5	272 12 46.2	3 20 30.6
13.0	190 48 34.0	3 41 31.5	13.0	234 21 12.4	- 0 0 53.3	13.0	278 22 10.8	3 44 8.5
13.5	196 49 9.3	+ 3 17 54.9	13.5	240 16 22.4	- 0 32 14.1	13.5	284 36 26.0	- 4 5 24.8
14.0	202 47 10.3	2 52 18.1	14.0	246 13 5.7	1 3 21.3	14.0	290 56 2.9	4 23 59.5
14.5	208 43 16.1	2 24 57.4	14.5	252 12 2.3	1 33 57.2	14.5	297 21 27.7	4 39 32.1
15.0	214 38 6.3	1 56 9.1	15.0	258 13 50.1	2 3 43.2	15.0	303 53 0.6	4 51 42.1
15.5	220 32 20.4	1 26 9.4	15.5	264 19 4.8	2 32 20.1	15.5	310 30 54.6	5 0 10.0
16.0	226 26 37.7	+ 0 55 14.8	16.0	270 28 18.7	- 2 59 27.8	16.0	317 15 14.7	- 5 4 37.9
16.5	232 21 36.1	+ 0 23 42.1	16.5	276 42 0.1	3 24 45.3	16.5	324 5 56.7	5 4 50.0
17.0	238 17 52.0	- 0 8 11.2	17.0	283 0 32.4	3 47 51.1	17.0	331 2 46.9	5 0 34.1
17.5	244 15 59.5	0 40 7.3	17.5	289 24 13.3	4 8 23.1	17.5	338 5 22.3	4 51 42.5
18.0	250 16 30.2	1 11 47.4	18.0	295 53 14.3	4 25 59.4	18.0	345 13 10.5	4 38 13.1
18.5	256 19 52.5	- 1 42 51.5	18.5	302 27 40.0	- 4 40 18.7	18.5	352 25 30.8	- 4 20 10.0
19.0	262 26 31.2	2 12 58.9	19.0	309 7 27.5	4 51 1.0	19.0	359 41 35.6	3 57 44.5
19.5	268 36 47.2	2 41 48.3	19.5	315 52 26.5	4 57 48.3	19.5	7 0 32.3	3 31 14.7
20.0	274 50 57.1	3 8 57.5	20.0	322 42 19.5	5 0 25.7	20.0	14 21 25.4	3 1 5.8
20.5	281 9 12.6	3 34 3.9	20.5	329 36 42.4	4 58 42.2	20.5	21 43 18.7	2 27 49.2
21.0	287 31 40.8	- 3 56 45.0	21.0	336 35 5.2	- 4 52 31.3	21.0	29 5 17.6	- 1 52 1.3
21.5	293 58 23.7	4 16 38.7	21.5	343 36 53.2	4 41 51.8	21.5	36 26 31.4	1 14 22.3
22.0	300 29 18.7	4 33 23.9	22.0	350 41 28.9	4 26 48.4	22.0	43 46 14.3	- 0 35 34.4
22.5	307 4 18.4	4 46 41.2	22.5	357 48 13.2	4 7 31.3	22.5	51 3 47.0	+ 0 3 39.5
23.0	313 43 11.6	4 56 13.5	23.0	4 56 27.3	3 44 16.7	23.0	58 18 37.2	0 42 37.3
23.5	320 25 43.5	- 5 1 46.5	23.5	12 5 33.9	- 3 17 26.2	23.5	65 30 19.9	+ 1 20 38.8
24.0	327 11 36.7	5 3 9.1	24.0	19 14 59.0	2 47 26.0	24.0	72 38 36.5	1 57 7.2
24.5	334 0 32.1	5 0 14.5	24.5	26 24 12.7	2 14 46.2	24.5	79 43 14.6	2 31 29.1
25.0	340 52 9.8	4 53 0.0	25.0	33 32 49.6	1 40 0.0	25.0	86 44 7.4	3 3 15.3
25.5	347 46 9.7	4 41 27.2	25.5	40 40 28.9	1 3 42.7	25.5	93 41 12.1	3 32 0.9
26.0	354 42 12.9	- 4 25 42.8	26.0	47 46 54.9	- 0 26 30.4	26.0	100 34 29.1	+ 3 57 25.2
26.5	1 40 2.0	4 5 57.6	26.5	54 51 55.9	+ 0 11 0.2	26.5	107 24 1.4	4 19 11.8
27.0	8 39 21.4	3 42 27.0	27.0	61 55 23.6	0 48 12.9	27.0	114 9 53.4	4 37 8.3
27.5	15 39 57.7	3 15 30.5	27.5	68 57 12.1	1 24 32.7	27.5	120 52 10.0	4 51 6.2
28.0	22 41 39.8	2 45 31.5	28.0	75 57 17.0	1 59 26.5	28.0	127 30 56.6	5 1 0.4
28.5	29 44 18.3	- 2 12 56.6	28.5	82 55 34.5	+ 2 32 23.2	28.5	134 6 18.1	+ 5 6 49.2
29.0	36 47 44.9	1 38 15.5	29.0	89 52 0.8	3 2 54.3	29.0	140 38 18.9	5 8 34.3
29.5	43 51 52.2	1 2 0.4	29.5	96 46 31.1	3 30 34.4	29.5	147 7 2.9	5 6 20.3
30.0	50 56 32.6	- 0 24 45.5	30.0	103 38 58.9	3 55 1.2	30.0	153 32 33.4	5 0 14.4
30.5	58 1 37.3	+ 0 12 53.6	30.5	110 29 15.9	4 15 56.3	30.5	159 54 53.5	4 50 26.6
31.0	65 6 55.7	+ 0 50 20.6	31.0	117 17 12.2	+ 4 33 4.9	31.0	166 14 6.0	+ 4 37 9.1
31.5	72 12 14.6	+ 1 26 59.0	31.5	124 2 36.1	+ 4 46 16.2	31.5	172 30 14.0	+ 4 20 36.0

## FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	OCTOBER.		Day of Month.	NOVEMBER.		Day of Month.	DECEMBER.	
	True Longitude.	Latitude.		True Longitude.	Latitude.		True Longitude.	Latitude.
1.0	166 14 6.0	+ 4 37 9.1	1.0	211 53 0.4	+ 1 34 32.2	1.0	244 18 6.9	- 1 22 12.7
1.5	172 30 14.0	4 20 36.0	1.5	217 49 6.9	1 2 39.0	1.5	250 12 31.4	1 53 12.6
2.0	178 43 21.5	4 1 3.1	2.0	223 44 6.9	+ 0 30 10.1	2.0	256 7 47.6	2 23 2.1
2.5	184 53 33.3	3 38 48.0	2.5	229 38 15.9	- 0 2 34.4	2.5	262 4 9.7	2 51 22.6
3.0	191 0 55.8	3 14 9.2	3.0	235 31 50.4	0 35 14.8	3.0	268 1 51.8	3 17 55.7
3.5	197 5 37.1	+ 2 47 26.0	3.5	241 25 7.8	- 1 7 31.6	3.5	274 1 8.1	- 3 42 23.9
4.0	203 7 47.5	2 18 58.2	4.0	247 18 26.8	1 39 5.7	4.0	280 2 13.0	4 4 30.4
4.5	209 7 39.8	1 49 6.1	4.5	253 12 7.3	2 9 38.5	4.5	286 5 21.4	4 23 59.4
5.0	215 5 29.1	1 18 9.6	5.0	259 6 31.1	2 38 51.9	5.0	292 10 49.1	4 40 36.1
5.5	221 1 33.2	0 46 28.6	5.5	265 2 1.5	3 6 28.4	5.5	298 18 52.8	4 54 6.6
6.0	226 56 12.6	+ 0 14 22.8	6.0	270 59 3.4	- 3 32 10.9	6.0	304 29 50.6	- 5 4 18.2
6.5	232 49 50.7	- 0 17 48.9	6.5	276 58 3.4	3 55 42.9	6.5	310 44 1.4	5 10 59.6
7.0	238 42 53.6	0 49 47.9	7.0	282 59 29.8	4 16 48.3	7.0	317 1 45.3	5 14 1.0
7.5	244 35 49.7	1 21 16.1	7.5	289 3 52.1	4 35 11.6	7.5	323 23 23.1	5 13 13.9
8.0	250 29 9.8	1 51 55.7	8.0	295 11 40.7	4 50 37.4	8.0	329 49 16.2	5 8 31.6
8.5	256 23 27.0	- 2 21 29.5	8.5	301 23 26.7	- 5 2 51.0	8.5	336 19 45.8	- 4 59 49.4
9.0	262 19 16.2	2 49 40.4	9.0	307 39 41.0	5 11 38.0	9.0	342 55 12.4	4 47 4.8
9.5	268 17 13.7	3 16 11.2	9.5	314 0 54.0	5 16 45.0	9.5	349 35 55.2	4 30 18.1
10.0	274 17 56.8	3 40 44.9	10.0	320 27 34.7	5 17 59.2	10.0	356 22 10.8	4 9 33.0
10.5	280 22 3.3	4 3 4.3	10.5	327 0 9.4	5 15 9.2	10.5	3 14 12.3	3 44 56.8
11.0	286 30 10.8	- 4 22 52.1	11.0	333 39 0.8	- 5 8 5.6	11.0	10 12 8.1	- 3 16 41.3
11.5	292 42 56.1	4 39 50.4	11.5	340 24 26.9	4 56 41.4	11.5	17 16 0.3	2 45 3.3
12.0	299 0 53.8	4 53 41.5	12.0	347 16 40.0	4 40 52.9	12.0	24 25 43.8	2 10 25.2
12.5	305 24 35.7	5 4 7.7	12.5	354 15 44.5	4 20 40.9	12.5	31 41 5.1	1 33 15.1
13.0	311 54 29.8	5 10 51.8	13.0	1 21 36.1	3 56 11.2	13.0	39 1 40.7	0 54 7.3
13.5	318 30 58.8	- 5 13 37.5	13.5	8 34 1.2	- 3 27 35.8	13.5	46 26 57.1	- 0 13 41.6
14.0	325 14 18.6	5 12 9.9	14.0	15 52 35.4	2 55 13.7	14.0	53 56 10.4	+ 0 27 17.7
14.5	332 4 37.3	5 6 16.7	14.5	23 16 43.2	2 19 31.5	14.5	61 28 26.8	1 8 2.9
15.0	339 1 54.0	4 55 49.3	15.0	30 45 38.7	1 41 3.0	15.0	69 2 43.7	1 47 44.5
15.5	346 5 57.9	4 40 43.5	15.5	38 18 26.0	- 1 0 28.8	15.5	76 37 52.0	2 25 33.5
16.0	353 16 27.4	- 4 21 0.9	16.0	45 54 0.6	- 0 18 35.4	16.0	84 12 38.0	+ 3 0 43.9
16.5	0 32 50.1	3 56 50.0	16.5	53 31 11.9	+ 0 23 40.4	16.5	91 45 46.8	3 32 34.2
17.0	7 54 23.1	3 28 26.6	17.0	61 8 45.5	1 5 44.2	17.0	99 16 5.2	4 0 29.5
17.5	15 20 14.6	2 56 14.4	17.5	68 45 25.9	1 46 26.1	17.5	106 42 24.8	4 24 2.9
18.0	22 49 25.0	2 20 44.8	18.0	76 19 59.5	2 25 3.0	18.0	114 3 44.6	4 42 55.7
18.5	30 20 48.9	- 1 42 36.1	18.5	83 51 17.6	+ 3 0 50.9	18.5	121 19 13.4	+ 4 56 57.8
19.0	37 53 18.3	1 2 32.3	19.0	91 18 18.6	3 33 12.2	19.0	128 28 11.7	5 6 7.1
19.5	45 25 44.7	- 0 21 21.3	19.5	98 40 10.2	4 1 37.1	19.5	135 30 11.3	5 10 28.3
20.0	52 57 1.8	+ 0 20 7.5	20.0	105 56 10.4	4 25 43.7	20.0	142 24 56.3	5 10 11.5
20.5	60 26 7.9	1 1 4.9	20.5	113 5 48.3	4 45 18.0	20.5	149 12 22.3	5 5 31.3
21.0	67 52 8.0	+ 1 40 43.9	21.0	120 8 44.0	+ 5 0 13.3	21.0	155 52 35.1	+ 4 56 45.4
21.5	75 14 15.0	2 18 21.8	21.5	127 4 48.1	5 10 29.0	21.5	162 25 49.6	4 44 13.6
22.0	82 31 50.7	2 53 21.1	22.0	133 54 0.5	5 16 9.7	22.0	168 52 28.1	4 28 16.6
22.5	89 44 26.0	3 25 10.3	22.5	140 36 29.6	5 17 24.0	22.5	175 12 59.1	4 9 15.5
23.0	96 51 40.7	3 53 24.2	23.0	147 12 30.8	5 14 23.9	23.0	181 27 55.3	3 47 31.3
23.5	103 53 23.0	+ 4 17 44.0	23.5	153 42 24.8	+ 5 7 23.5	23.5	187 37 52.7	+ 3 23 24.6
24.0	110 49 28.4	4 37 56.6	24.0	160 6 36.6	4 56 38.4	24.0	193 43 29.5	2 57 15.5
24.5	117 39 58.8	4 53 54.2	24.5	166 25 34.4	4 42 25.2	24.5	199 45 24.8	2 29 23.3
25.0	124 25 1.7	5 5 33.7	25.0	172 39 48.1	4 25 1.1	25.0	205 44 17.8	2 0 6.8
25.5	131 4 48.3	5 12 55.7	25.5	178 49 48.7	4 4 43.8	25.5	211 40 47.2	1 29 44.5
26.0	137 39 33.1	+ 5 16 4.4	26.0	184 56 7.6	+ 3 41 51.1	26.0	217 35 30.5	+ 0 58 34.4
26.5	144 9 33.0	5 15 6.6	26.5	190 59 15.6	3 16 40.9	26.5	223 29 3.4	+ 0 26 54.4
27.0	150 35 6.1	5 10 11.3	27.0	196 59 42.7	2 49 31.2	27.0	229 21 59.4	- 0 4 57.7
27.5	156 56 31.3	5 1 29.6	27.5	202 57 57.5	2 20 40.3	27.5	235 14 49.8	0 36 44.0
28.0	163 14 7.6	4 49 14.1	28.0	208 54 27.0	1 50 26.8	28.0	241 8 3.3	1 8 6.2
28.5	169 28 13.8	+ 4 33 38.7	28.5	214 49 36.6	+ 1 19 9.2	28.5	247 2 5.4	- 1 38 46.2
29.0	175 39 8.3	4 14 58.8	29.0	220 43 49.8	0 47 6.4	29.0	252 57 18.9	2 8 25.6
29.5	181 47 8.6	3 53 30.6	29.5	226 37 28.2	+ 0 14 37.5	29.5	258 54 3.6	2 36 45.8
30.0	187 52 31.4	3 29 31.2	30.0	232 30 51.8	- 0 17 58.3	30.0	264 52 36.5	3 3 28.4
30.5	193 55 32.8	3 3 18.7	30.5	238 24 19.0	0 50 21.5	30.5	270 53 11.7	3 28 15.3
31.0	199 56 28.1	+ 2 35 11.8	31.0	244 18 6.9	- 1 22 12.7	31.0	276 56 0.7	- 3 50 48.6
31.5	205 55 32.4	+ 2 5 29.8	31.5	250 12 31.4	- 1 53 12.6	31.5	283 1 12.6	- 4 10 51.2

GREENWICH MEAN NOON.									
Date.	MOON'S EQUATOR.			$\Gamma'$ Longitude of the Moon's Perigee. Daily Motion, + 6'.684	$\Omega$ Mean Longitude of Moon's Ascending Node. Daily Motion, - 3'.177	$\zeta$ Moon's Mean Longitude.	Mean Solar Days.	Motion of Moon in Mean Longitude.	
	$i$ Inclination to the Earth's Equator.	$\Delta$ Ascending Node on Earth's Equator to Ascending Node on Ecliptic.	$\Omega'$ Ascending Node on Earth's Equator.						
Jan. 0	22 52.9	248 59.3	356 31.6	21 10.5	65 47.6	150 38.8	0.1	1 19.06	
10	22 52.1	248 26.7	356 32.4	22 17.3	65 15.8	282 24.6	0.2	2 38.12	
20	22 51.3	247 54.2	356 33.2	23 24.2	64 44.0	54 10.5	0.3	3 57.18	
30	22 50.5	247 21.6	356 34.0	24 31.0	64 12.2	185 56.3	0.4	5 16.23	
Feb. 9	22 49.8	246 49.1	356 34.8	25 37.8	63 40.5	317 42.2	0.5	6 35.29	
							0.6	7 54.35	
19	22 49.1	246 16.6	356 35.6	26 44.7	63 8.7	89 28.0	0.7	9 13.41	
Mar. 1	22 48.3	245 44.0	356 36.5	27 51.5	62 36.9	221 13.8	0.8	10 32.47	
11	22 47.6	245 11.4	356 37.4	28 58.4	62 5.2	352 59.7	0.9	11 51.53	
21	22 46.8	244 38.8	356 38.3	30 5.2	61 33.4	124 45.5	1.0	13 10.58	
31	22 46.1	244 6.2	356 39.2	31 12.1	61 1.6	256 31.3			
							2.0	26 21.17	
Apr. 10	22 45.4	243 33.6	356 40.1	32 18.9	60 29.8	28 17.2	3.0	39 31.75	
20	22 44.6	243 1.0	356 41.0	33 25.7	59 58.1	160 3.0	4.0	52 42.33	
30	22 43.9	242 28.3	356 42.0	34 32.6	59 26.3	291 48.9	5.0	65 52.92	
May 10	22 43.2	241 55.7	356 43.0	35 39.4	58 54.5	63 34.7	6.0	79 3.50	
20	22 42.5	241 23.0	356 44.0	36 46.3	58 22.7	195 20.5	7.0	92 14.09	
							8.0	105 24.67	
30	22 41.8	240 50.3	356 45.0	37 53.1	57 51.0	327 6.4	9.0	118 35.25	
June 9	22 41.1	240 17.6	356 46.0	39 0.0	57 19.2	98 52.2	10.0	131 45.84	
19	22 40.4	239 44.9	356 47.1	40 6.8	56 47.4	230 38.1	Hours.	0 32.94	
29	22 39.7	239 12.1	356 48.2	41 13.6	56 15.7	2 23.9	1	1 5.88	
July 9	22 39.0	238 39.3	356 49.3	42 20.5	55 43.9	134 9.7	2	1 38.82	
							3	2 11.76	
19	22 38.3	238 6.5	356 50.4	43 27.3	55 12.1	265 55.6	4	2 44.70	
29	22 37.6	237 33.7	356 51.5	44 34.2	54 40.3	37 41.4	5	3 17.65	
Aug. 8	22 36.9	237 0.9	356 52.7	45 41.0	54 8.6	169 27.2	6	3 50.59	
18	22 36.2	236 28.1	356 53.9	46 47.9	53 36.8	301 13.1	7	4 23.53	
28	22 35.5	235 55.2	356 55.1	47 54.7	53 5.0	72 58.9	8	4 56.47	
							9	5 29.41	
Sept. 7	22 34.9	235 22.3	356 56.3	49 1.5	52 33.2	204 44.8	10	6 2.35	
17	22 34.2	234 49.4	356 57.5	50 8.4	52 1.5	336 30.6	11	6 35.29	
27	22 33.6	234 16.5	356 58.7	51 15.2	51 29.7	108 16.4	12	7 8.23	
Oct. 7	22 32.9	233 43.6	357 0.0	52 22.1	50 57.9	240 2.3	13	7 41.17	
17	22 32.2	233 10.7	357 1.3	53 28.9	50 26.2	11 48.1	14	8 14.11	
							15	8 47.06	
27	22 31.6	232 37.7	357 2.6	54 35.8	49 54.4	143 33.9	16	9 20.00	
Nov. 6	22 30.9	232 4.7	357 3.9	55 42.6	49 22.6	275 19.8	17	9 52.94	
16	22 30.3	231 31.7	357 5.2	56 49.4	48 50.8	47 5.6	18	10 25.88	
26	22 29.6	230 58.7	357 6.5	57 56.3	48 19.1	178 51.5	19	10 58.82	
Dec. 6	22 29.0	230 25.7	357 7.9	59 3.1	47 47.3	310 37.3	20	11 31.76	
							21	12 4.70	
16	22 28.4	229 52.6	357 9.3	60 10.0	47 15.5	82 23.1	22	12 37.64	
26	22 27.7	229 19.5	357 10.7	61 16.8	46 43.7	214 9.0	23		
36	22 27.1	228 46.4	357 12.1	62 23.7	46 12.0	345 54.8			

# MOON'S LIBRATION. SUN'S ABERRATION AND PARALLAX. 285

## QUANTITIES REQUIRED IN COMPUTING THE MOON'S LIBRATION.

ARGUMENT,  $(\Omega - \lambda)$ , or  $(\Omega - \lambda - 180^\circ)$ .

$\Omega - \lambda$	$\mu$	$\frac{1}{A}$	$B$	$\Omega - \lambda$
0	0.0	39	0 0.0	180
2	0.0	39	0 3.1	178
4	0.1	39	0 6.2	176
6	0.2	39	0 9.3	174
8	0.2	39	0 12.4	172
10	0.2	39	0 15.4	170
12	0.3	40	0 18.5	168
14	0.3	40	0 21.5	166
16	0.3	40	0 24.5	164
18	0.3	41	0 27.4	162
20	0.4	41	0 30.4	160
22	0.4	42	0 33.2	158
24	0.4	42	0 36.1	156
26	0.5	43	0 38.9	154
28	0.5	44	0 41.7	152
30	0.5	45	0 44.4	150
32	0.5	46	0 47.0	148
34	0.5	47	0 49.7	146
36	0.5	48	0 52.2	144
38	0.6	49	0 54.7	142
40	0.6	50	0 57.1	140
42	0.6	52	0 59.4	138
44	0.6	54	1 1.7	136
46	0.6	56	1 3.9	134
48	0.6	58	1 6.0	132
50	0.6	60	1 8.0	130
52	0.6	63	1 10.0	128
54	0.5	66	1 11.8	126
56	0.5	69	1 13.6	124
58	0.5	73	1 15.3	122
60	0.5	77	1 16.9	120
62	0.5	83	1 18.4	118
64	0.5	89	1 19.8	116
66	0.4	95	1 21.1	114
68	0.4	103	1 22.3	112
70	0.4	113	1 23.4	110
72	0.4	125	1 24.4	108
74	0.3	141	1 25.3	106
76	0.3	160	1 26.1	104
78	0.2	186	1 26.8	102
80	0.2	222	1 27.4	100
82	0.2	278	1 27.9	98
84	0.1	370	1 28.3	96
86	0.1	554	1 28.6	94
88	0.0	1110	1 28.7	92
90	0.0	$\infty$	1 28.8	90

$\mu$  has the sign of  $\tan (\lambda - \Omega)$

$A$  has the sign of  $\cos (\Omega - \lambda)$

$B$  has the sign of  $\sin (\Omega - \lambda)$

See formulæ, page 439.

## SUN'S ABERRATION AND HORIZONTAL PARALLAX.

FOR GREENWICH MEAN NOON.

Date.	Aberration. (Struve.)	Hor. Par.
1910.	"	"
Jan. 0	- 20.79	8.95
10	20.78	8.95
20	20.77	8.94
30	20.75	8.93
Feb. 9	20.71	8.92
19	- 20.67	8.90
March 1	20.62	8.87
11	20.57	8.85
21	20.51	8.83
31	20.45	8.81
April 10	- 20.39	8.78
20	20.34	8.76
30	20.28	8.73
May 10	20.23	8.71
20	20.19	8.69
30	- 20.16	8.68
June 9	20.13	8.67
19	20.11	8.66
29	20.10	8.65
July 9	20.10	8.66
19	- 20.11	8.66
29	20.13	8.67
Aug. 8	20.16	8.68
18	20.20	8.70
28	20.24	8.71
Sept. 7	- 20.29	8.73
17	20.34	8.76
27	20.40	8.78
Oct. 7	20.46	8.81
17	20.52	8.83
27	- 20.57	8.86
Nov. 6	20.63	8.88
16	20.67	8.90
26	20.71	8.92
Dec. 6	20.75	8.93
16	- 20.77	8.94
26	20.78	8.95
36	- 20.79	8.95

Sun's Mean Equatorial Horizontal Parallax.

8".80;  $\log = 0.94448$ .

## PRECESSION AND OBLIQUITY, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## FOR GREENWICH MEAN NOON.

Date.	Precession in Longitude from 1910.0.	Nutation.			Obliquity of Ecliptic. (Peters.)	Date.	Precession in Longitude from 1910.0.	Nutation.			Obliquity of Ecliptic. (Peters.)
		In Longi- tude.	In R. A.	In Obliq- uity.				In Longi- tude.	In R. A.	In Obliq- uity.	
					23° 27'						23° 27'
Jan. 0	- 0.10	- 15.17	- 0.928	+ 3.30	6.42	July 4	+ 25.36	- 13.60	- 0.833	+ 4.69	7.56
5	+ 0.59	14.93	0.913	3.38	6.48	9	26.05	13.39	0.819	4.76	7.63
10	1.28	14.69	0.898	3.47	6.57	14	26.74	13.19	0.807	4.85	7.71
15	1.96	14.47	0.884	3.58	6.67	19	27.42	13.01	0.796	4.95	7.81
20	2.65	14.28	0.873	3.70	6.78	24	28.11	12.86	0.787	5.06	7.91
25	+ 3.34	- 14.14	- 0.865	+ 3.82	6.90	29	+ 28.80	- 12.75	- 0.780	+ 5.18	8.02
30	4.03	14.03	0.859	3.95	7.03	Aug. 3	29.49	12.66	0.775	5.30	8.14
Feb. 4	4.72	13.97	0.855	4.09	7.16	8	30.18	12.61	0.772	5.43	8.26
9	5.40	13.94	0.853	4.23	7.29	13	30.86	12.59	0.771	5.56	8.38
14	6.09	13.95	0.853	4.36	7.42	18	31.55	12.61	0.772	5.68	8.50
19	+ 6.78	- 14.01	- 0.856	+ 4.49	7.54	23	+ 32.24	- 12.66	- 0.775	+ 5.80	8.61
24	7.47	14.09	0.861	4.60	7.64	28	32.93	12.74	0.779	5.90	8.71
Mar. 1	8.16	14.20	0.868	4.71	7.74	Sept. 2	33.62	12.84	0.785	6.00	8.80
6	8.84	14.34	0.877	4.80	7.83	7	34.30	12.96	0.793	6.09	8.88
11	9.53	14.50	0.887	4.88	7.90	12	34.99	13.11	0.802	6.16	8.95
16	+ 10.22	- 14.67	- 0.897	+ 4.94	7.95	17	+ 35.68	- 13.27	- 0.812	+ 6.22	9.00
21	10.91	14.84	0.908	4.99	8.00	22	36.37	13.43	0.822	6.26	9.04
26	11.60	15.02	0.919	5.02	8.03	27	37.06	13.60	0.832	6.29	9.06
31	12.28	15.19	0.930	5.03	8.03	Oct. 2	37.75	13.77	0.842	6.31	9.07
Apr. 5	12.97	15.35	0.940	5.03	8.02	7	38.43	13.92	0.852	6.32	9.07
10	+ 13.66	- 15.50	- 0.949	+ 5.01	8.00	12	+ 39.12	- 14.05	- 0.860	+ 6.30	9.05
15	14.35	15.62	0.956	4.98	7.96	17	39.81	14.17	0.867	6.26	9.01
20	15.04	15.71	0.961	4.94	7.91	22	40.50	14.25	0.872	6.21	8.95
25	15.73	15.77	0.965	4.89	7.85	27	41.19	14.30	0.874	6.16	8.89
30	16.41	15.79	0.966	4.83	7.79	Nov. 1	41.87	14.30	0.875	6.10	8.82
May 5	+ 17.10	- 15.78	- 0.965	+ 4.78	7.73	6	+ 42.56	- 14.27	- 0.873	+ 6.04	8.76
10	17.79	15.74	0.963	4.72	7.66	11	43.25	14.20	0.869	5.98	8.69
15	18.48	15.66	0.958	4.67	7.60	16	43.94	14.10	0.863	5.92	8.62
20	19.17	15.54	0.951	4.62	7.55	21	44.63	13.95	0.854	5.86	8.56
25	19.85	15.39	0.942	4.58	7.51	26	45.31	13.77	0.843	5.81	8.50
30	+ 20.54	- 15.22	- 0.931	+ 4.55	7.47	Dec. 1	+ 46.00	- 13.56	- 0.830	+ 5.77	8.45
June 4	21.23	15.02	0.919	4.53	7.45	6	46.69	13.32	0.815	5.74	8.41
9	21.92	14.81	0.906	4.52	7.43	11	47.38	13.05	0.798	5.72	8.39
14	22.61	14.58	0.892	4.53	7.43	16	48.07	12.77	0.781	5.72	8.39
19	23.29	14.33	0.877	4.55	7.44	21	48.76	12.48	0.764	5.74	8.40
24	+ 23.98	- 14.08	- 0.862	+ 4.58	7.46	26	+ 49.44	- 12.19	- 0.746	+ 5.78	8.43
29	24.67	13.83	0.847	4.63	7.50	31	50.13	11.90	0.728	5.83	8.47
July 4	+ 25.36	- 13.60	- 0.833	+ 4.69	7.56	36	+ 50.82	- 11.63	- 0.712	+ 5.89	8.53
Mean Obliquity, 1910.0. . . . .											
Peters . . . . . 23 27 3.11											
Hansen . . . . . 23 27 3.34											
Le Verrier . . . . . 23 27 3.27											
Newcomb . . . . . 23 27 3.58											
Precession for 1910 (Struve). 50.2661 log = 1.70128											
Precession in a Solar day . . . 0.1376 log = 9.13869											
Precession in a Sidereal day . . 0.1372 log = 9.13751											



## FOR GREENWICH MEAN NOON.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
Jan. 0	+ 0.23	+ 0.04	Feb. 15	- 0.19	+ 0.04	Apr. 1	- 0.13	- 0.09	May 16	+ 0.29	+ 0.02
1	0.16	0.07	16	0.20	- 0.01	2	- 0.04	0.10	17	0.23	0.06
2	+ 0.07	0.09	17	0.15	0.05	3	+ 0.05	0.08	18	0.14	0.08
3	- 0.03	0.09	18	- 0.06	0.08	4	0.12	- 0.05	19	+ 0.04	0.09
4	0.12	0.07	19	+ 0.05	0.10	5	0.16	0.00	20	- 0.06	0.08
5	0.20	0.04	20	0.16	0.09	6	0.15	+ 0.04	21	0.14	0.06
6	0.24	+ 0.01	21	0.23	0.06	7	+ 0.09	0.08	22	0.20	+ 0.03
7	0.24	- 0.03	22	0.26	- 0.02	8	0.00	0.10	23	0.22	- 0.01
8	0.20	0.07	23	0.25	+ 0.02	9	- 0.10	0.10	24	0.21	0.05
9	0.12	0.09	24	0.20	0.06	10	0.18	0.07	25	0.17	0.08
10	- 0.02	- 0.10	25	+ 0.12	+ 0.08	11	- 0.21	+ 0.03	26	- 0.08	- 0.10
11	+ 0.08	0.08	26	+ 0.02	0.09	12	0.18	- 0.02	27	+ 0.01	0.09
12	0.16	0.05	27	- 0.08	0.08	13	- 0.11	0.07	28	0.09	0.07
13	0.19	- 0.01	28	0.16	0.06	14	0.00	0.09	29	0.15	- 0.03
14	0.18	+ 0.04	Mar. 1	0.22	+ 0.03	15	+ 0.11	0.10	30	0.16	+ 0.01
15	0.12	0.08	2	0.25	- 0.01	16	0.21	0.08	31	0.12	0.05
16	+ 0.02	0.10	3	0.24	0.05	17	0.28	- 0.05	June 1	+ 0.04	0.09
17	- 0.09	0.09	4	0.19	0.08	18	0.29	0.00	2	- 0.06	0.10
18	0.17	0.07	5	0.11	0.10	19	0.26	+ 0.04	3	0.16	0.09
19	0.21	+ 0.03	6	- 0.01	0.10	20	0.19	0.07	4	0.23	0.06
20	- 0.20	- 0.02	7	+ 0.09	- 0.08	21	+ 0.10	+ 0.09	5	- 0.25	+ 0.01
21	0.13	0.06	8	0.15	- 0.04	22	0.00	0.09	6	0.21	- 0.04
22	- 0.03	0.09	9	0.17	+ 0.01	23	- 0.10	0.08	7	- 0.11	0.08
23	+ 0.08	0.10	10	0.15	0.06	24	0.17	0.05	8	+ 0.01	0.10
24	0.18	0.08	11	+ 0.08	0.09	25	0.22	+ 0.02	9	0.13	0.09
25	0.24	0.05	12	- 0.02	0.10	26	0.23	- 0.02	10	0.23	0.07
26	0.26	- 0.01	13	0.11	0.09	27	0.21	0.06	11	0.29	- 0.03
27	0.24	+ 0.03	14	0.17	0.06	28	0.15	0.09	12	0.29	+ 0.01
28	0.18	0.06	15	0.19	+ 0.01	29	- 0.07	0.10	13	0.25	0.05
29	+ 0.09	0.08	16	0.16	- 0.04	30	+ 0.03	0.09	14	0.18	0.08
30	- 0.01	+ 0.09	17	- 0.08	- 0.08	May 1	+ 0.10	- 0.06	15	+ 0.08	+ 0.09
31	0.10	0.08	18	+ 0.03	0.10	2	0.15	- 0.02	16	- 0.03	0.09
Feb. 1	0.18	0.05	19	0.14	0.09	3	0.15	+ 0.03	17	0.12	0.07
2	0.23	+ 0.02	20	0.23	0.07	4	0.10	0.07	18	0.18	+ 0.04
3	0.25	- 0.02	21	0.27	- 0.03	5	+ 0.01	0.10	19	0.21	0.00
4	0.22	0.06	22	0.27	+ 0.01	6	- 0.09	0.10	20	0.21	- 0.04
5	0.16	0.08	23	0.23	0.05	7	0.18	0.08	21	0.17	0.07
6	- 0.07	0.10	24	0.15	0.08	8	0.23	+ 0.04	22	0.10	0.09
7	+ 0.04	0.09	25	+ 0.06	0.09	9	0.22	- 0.01	23	- 0.01	0.10
8	0.13	0.06	26	- 0.04	0.09	10	0.16	0.05	24	+ 0.08	0.08
9	+ 0.18	- 0.02	27	- 0.13	+ 0.07	11	- 0.05	- 0.08	25	+ 0.15	- 0.05
10	0.18	+ 0.03	28	0.20	0.04	12	+ 0.07	0.10	26	0.18	0.00
11	0.14	0.07	29	0.24	+ 0.01	13	0.18	0.08	27	0.15	+ 0.04
12	+ 0.06	0.10	30	0.24	- 0.03	14	0.26	0.06	28	+ 0.08	0.08
13	- 0.04	0.10	31	0.21	0.07	15	0.30	- 0.02	29	- 0.02	0.10
14	0.14	0.08	Apr. 1	0.13	0.09	16	0.29	+ 0.02	30	0.12	0.10
15	- 0.19	+ 0.04	2	- 0.04	- 0.10	17	+ 0.23	+ 0.06	July 1	- 0.21	+ 0.07

# 288 TERMS OF SHORT PERIOD IN THE NUTATION, 1910.

FOR GREENWICH MEAN NOON.											
Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
July 1	-0.21	+0.07	Aug. 16	-0.07	-0.10	Oct. 1	+0.18	+0.07	Nov. 16	-0.25	+0.01
2	0.25	+0.03	17	+0.02	0.09	2	+0.09	0.09	17	0.21	-0.04
3	0.23	-0.02	18	0.11	0.07	3	-0.02	0.09	18	-0.12	0.08
4	0.16	0.06	19	0.17	-0.03	4	0.11	0.07	19	+0.01	0.10
5	-0.05	0.09	20	0.18	+0.01	5	0.18	0.04	20	0.14	0.10
6	+0.08	0.10	21	0.15	0.06	6	0.21	+0.01	21	0.24	0.07
7	0.19	0.08	22	+0.07	0.09	7	0.21	-0.03	22	0.30	-0.03
8	0.26	-0.05	23	-0.03	0.10	8	0.18	0.07	23	0.31	+0.02
9	0.28	0.00	24	0.13	0.09	9	0.12	0.09	24	0.26	0.06
10	0.26	+0.04	25	0.21	0.06	10	-0.04	0.10	25	0.17	0.09
11	+0.19	+0.07	26	-0.23	+0.01	11	+0.04	-0.09	26	+0.07	+0.10
12	+0.10	0.09	27	0.20	-0.04	12	0.11	0.06	27	-0.03	0.09
13	0.00	0.09	28	-0.11	0.08	13	0.15	-0.02	28	0.12	0.06
14	-0.09	0.07	29	0.00	0.10	14	0.15	+0.03	29	0.18	+0.03
15	0.16	0.05	30	+0.12	0.10	15	0.10	0.07	30	0.20	-0.01
16	0.20	+0.01	31	0.21	0.07	16	+0.01	0.10	Dec. 1	0.18	0.05
17	0.21	-0.03	Sept. 1	0.27	-0.03	17	-0.09	0.10	2	0.14	0.08
18	0.18	0.06	2	0.27	+0.01	18	0.18	0.08	3	-0.07	0.09
19	0.12	0.09	3	0.23	0.05	19	0.23	+0.04	4	+0.01	0.10
20	-0.03	0.10	4	0.15	0.08	20	0.23	-0.01	5	0.09	0.08
21	+0.06	-0.09	5	+0.05	+0.09	21	-0.17	-0.06	6	+0.14	-0.04
22	0.14	0.06	6	-0.05	0.09	22	-0.06	0.09	7	0.16	0.00
23	0.18	-0.02	7	0.13	0.07	23	+0.06	0.10	8	0.13	+0.05
24	0.18	+0.03	8	0.19	+0.03	24	0.18	0.09	9	+0.06	0.08
25	0.12	0.07	9	0.22	-0.01	25	0.27	0.06	10	-0.04	0.10
26	+0.03	0.10	10	0.21	0.04	26	0.30	-0.02	11	0.15	0.10
27	-0.08	0.10	11	0.17	0.07	27	0.28	+0.03	12	0.24	0.07
28	0.17	0.08	12	0.10	0.09	28	0.22	0.07	13	0.28	+0.03
29	0.23	+0.04	13	-0.01	0.10	29	0.13	0.09	14	0.26	-0.02
30	0.24	-0.01	14	+0.07	0.08	30	+0.03	0.09	15	0.18	0.07
31	-0.19	-0.05	15	+0.14	-0.05	31	-0.07	+0.08	16	-0.06	-0.10
Aug. 1	-0.09	0.09	16	0.17	0.00	Nov. 1	0.15	0.05	17	+0.08	0.10
2	+0.03	0.10	17	0.15	+0.05	2	0.20	+0.02	18	0.20	0.08
3	0.15	0.09	18	+0.09	0.08	3	0.21	-0.02	19	0.28	-0.04
4	0.23	0.06	19	0.00	0.10	4	0.19	0.06	20	0.31	0.00
5	0.27	-0.02	20	-0.11	0.10	5	0.13	0.08	21	0.28	+0.05
6	0.26	+0.03	21	0.19	0.07	6	-0.06	0.10	22	0.21	0.08
7	0.21	0.06	22	0.22	+0.03	7	+0.02	0.09	23	+0.11	0.10
8	0.12	0.09	23	0.20	-0.02	8	0.10	0.07	24	0.00	0.09
9	+0.02	0.09	24	0.13	0.07	9	0.14	-0.03	25	-0.09	0.07
10	-0.07	+0.08	25	-0.02	-0.10	10	+0.15	+0.02	26	-0.15	+0.04
11	0.15	0.06	26	+0.10	0.10	11	0.11	0.06	27	0.19	0.00
12	0.20	+0.02	27	0.20	0.08	12	+0.03	0.09	28	0.18	-0.04
13	0.22	-0.02	28	0.27	-0.04	13	-0.07	0.10	29	0.15	0.07
14	0.20	0.05	29	0.29	0.00	14	0.17	0.09	30	-0.08	0.09
15	0.15	0.08	30	0.26	+0.04	15	0.24	0.06	31	0.00	0.10
16	-0.07	-0.10	Oct. 1	+0.18	+0.07	16	-0.25	+0.01	32	+0.08	-0.08

PART II

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON.

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF STRUVE AND PETERS.

NOTATION.

- $\tau$ , the time, reckoned in units of one year, from the beginning of the Besselian fictitious year (1910, January 0<sup>d</sup>.521, Washington mean time),  
 $\alpha_0, \delta_0$ , the star's mean right ascension and declination at the beginning of the fictitious year,  
 $\alpha, \delta$ , the star's apparent right ascension and declination at the time  $\tau$ ,  
 $\mu, \mu'$ , the annual proper motion in right ascension and declination,  
 $\odot$ , the Sun's true longitude,  
 $\Omega$ , the longitude of the Moon's ascending node,  
 $\omega$ , the obliquity of the ecliptic,
- |  |
|--|
| $\Gamma$ , the longitude of the Sun's perigee,<br>$\Gamma'$ , the longitude of the Moon's perigee,<br>$\zeta$ , the Moon's mean longitude. |
|--|

BESSELIAN STAR-NUMBERS.

$\begin{aligned} A &= \tau - 0.342\,55 \sin \Omega \\ &+ 0.004\,10 \sin 2\, \Omega \\ &- 0.025\,19 \sin 2\, \odot \\ &+ 0.002\,93 \sin (\odot + 81^\circ\,50') \\ &- 0.004\,05 \sin 2\, \zeta \\ &+ 0.001\,35 \sin (\zeta - \Gamma') \\ B &= -9.2241 \cos \Omega \\ &+ 0.0895 \cos 2\, \Omega \\ &- 0.5506 \cos 2\, \odot \\ &- 0.0092 \cos (\odot + 281^\circ\,24') \\ &- 0.0885 \cos 2\, \zeta \\ C &= -20.4451 \cos \omega \cos \odot \\ D &= -20.4451 \sin \odot \\ E &= -0.0442 \sin \Omega + 0''.0014 \sin 2\, \Omega - 0''.0031 \sin 2\, \odot \end{aligned}$	$\begin{aligned} A' &= \tau - 0.342\,55 \sin \Omega \\ &+ 0.004\,10 \sin 2\, \Omega \\ &- 0.025\,19 \sin 2\, \odot \\ &+ 0.002\,93 \sin (\odot + 81^\circ\,50') \\ B' &= -9.2241 \cos \Omega \\ &+ 0.0895 \cos 2\, \Omega \\ &- 0.5506 \cos 2\, \odot \\ &- 0.0092 \cos (\odot + 281^\circ\,24') \\ C' &= -20.4451 \cos \omega \cos \odot \\ D' &= -20.4451 \sin \odot \\ E' &= -0.0442 \sin \Omega + 0''.0014 \sin 2\, \Omega - 0''.0031 \sin 2\, \odot \end{aligned}$
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BESSEL'S Star-Constants.

$$\begin{aligned} a &= 3''.072\,91 + 1''.336\,75 \sin \alpha_0 \tan \delta_0 = \text{precession in right ascension} \\ b &= \frac{1}{15} \cos \alpha_0 \tan \delta_0 \\ c &= \frac{1}{15} \cos \alpha_0 \sec \delta_0 \\ d &= \frac{1}{15} \sin \alpha_0 \sec \delta_0 \\ a' &= 20''.0512 \cos \alpha_0 = \text{precession in declination} \\ b' &= -\sin \alpha_0 \\ c' &= \tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0 \\ d' &= \cos \alpha_0 \sin \delta_0 \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned} \alpha &= \alpha_0 + \tau \mu + Aa + Bb + Cc + Dd + \frac{1}{15} E & (\text{in time}) \\ \delta &= \delta_0 + \tau \mu' + Aa' + Bb' + Cc' + Dd' & (\text{in arc}) \end{aligned}$$

INDEPENDENT STAR-NUMBERS.

$$\begin{aligned} f &= 46''.0936 A + E \text{ (in arc)} = 3''.072\,91 A + \frac{1}{15} E & (\text{in time}) \\ f' &= 46''.0936 A' + E \text{ (in arc)} = 3''.072\,91 A' + \frac{1}{15} E & (\text{in time}) \\ g \sin G &= B & g' \sin G' &= B' & h \sin H &= C & i &= C \tan \omega \\ g \cos G &= 20''.0512 A & g' \cos G' &= 20''.0512 A' & h \cos H &= D \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned} \alpha &= \alpha_0 + f + \tau \mu + \frac{1}{15} g \sin (G + \alpha_0) \tan \delta_0 + \frac{1}{15} h \sin (H + \alpha_0) \sec \delta_0 & (\text{in time}) \\ \delta &= \delta_0 + \tau \mu' + g \cos (G + \alpha_0) + h \cos (H + \alpha_0) \sin \delta_0 + i \cos \delta_0 & (\text{in arc}) \end{aligned}$$

- NOTES.—(1) The quantities  $A', B', f', g',$  and  $G'$  are to be used instead of  $A, B, f, g,$  and  $G$  whenever it is necessary to omit the short period terms, as, for example, in computing the ephemeris of a star at ten-day intervals.
- (2) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.
- (3) In using the star-constants of the *British Association Catalogue*,  $a, b, c, d, a', b', c', d'$ , with the star-numbers of this Ephemeris, the quantities to be formed are  $Ac, Bd, Ca, Db, -Ac', -Bd', -Ca', -Db'$ .

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Jan. 0	-9.47305	-0.5298	-0.50982	+1.30403	Feb. 15	-9.19100	-0.6440	-1.19512	+1.05051
1	9.47031	0.5340	0.55178	1.30261	16	9.18162	0.6426	1.20004	1.03865
2	9.46792	0.5360	0.58993	1.30104	17	9.17000	0.6421	1.20479	1.02632
3	9.46528	0.5358	0.62485	1.29933	18	9.15688	0.6431	1.20935	1.01350
4	9.46184	0.5339	0.65706	1.29748	19	9.14330	0.6458	1.21372	1.00016
<sup>h</sup> (7.0) 5	-9.45725	-0.5310	-0.68691	+1.29548	<sup>h</sup> (10.0) 20	-9.13030	-0.6502	-1.21792	+0.98627
6	9.45130	0.5283	0.71471	1.29333	21	9.11916	0.6557	1.22194	0.97179
7	9.44406	0.5268	0.74072	1.29103	22	9.11073	0.6617	1.22578	0.95667
8	9.43587	0.5272	0.76512	1.28858	23	9.10527	0.6674	1.22946	0.94088
9	9.42724	0.5301	0.78809	1.28598	24	9.10257	0.6721	1.23298	0.92436
10	-9.41873	-0.5353	-0.80978	+1.28323	25	-9.10147	-0.6752	-1.23633	+0.90706
11	9.41097	0.5421	0.83030	1.28032	26	9.10079	0.6766	1.23953	0.88891
12	9.40435	0.5497	0.84976	1.27725	27	9.09920	0.6764	1.24256	0.86984
13	9.39901	0.5569	0.86826	1.27403	28	9.09545	0.6750	1.24544	0.84975
14	9.39480	0.5630	0.88586	1.27064	Mar. 1	9.08891	0.6731	1.24818	0.82857
15	-9.39127	-0.5671	-0.90264	+1.26709	2	-9.07925	-0.6715	-1.25075	+0.80617
16	9.38782	0.5691	0.91866	1.26337	3	9.06681	0.6709	1.25318	0.78242
17	9.38382	0.5691	0.93398	1.25948	4	9.05239	0.6717	1.25547	0.75716
18	9.37871	0.5678	0.94864	1.25541	5	9.03735	0.6742	1.25760	0.73022
19	9.37210	0.5659	0.96268	1.25118	6	9.02313	0.6781	1.25960	0.70136
<sup>h</sup> (8.0) 20	-9.36393	-0.5644	-0.97615	+1.24676	<sup>h</sup> (11.0) 7	-9.01106	-0.6829	-1.26146	+0.67033
21	9.35447	0.5643	0.98907	1.24216	8	9.00195	0.6880	1.26317	0.63678
22	9.34426	0.5662	1.00149	1.23737	9	8.99600	0.6925	1.26474	0.60029
23	9.33393	0.5702	1.01342	1.23240	10	8.99251	0.6958	1.26618	0.56033
24	9.32430	0.5762	1.02490	1.22723	11	8.99025	0.6975	1.26748	0.51619
25	-9.31607	-0.5834	-1.03595	+1.22186	12	-8.98762	-0.6976	-1.26864	+0.46694
26	9.30967	0.5908	1.04659	1.21628	13	8.98295	0.6962	1.26967	0.41126
27	9.30512	0.5977	1.05684	1.21050	14	8.97506	0.6940	1.27056	0.34726
28	9.30207	0.6031	1.06672	1.20450	15	8.96308	0.6914	1.27132	0.27208
29	9.29986	0.6067	1.07624	1.19828	16	8.94714	0.6894	1.27195	0.18101
30	-9.29761	-0.6083	-1.08542	+1.19183	17	-8.92783	-0.6885	-1.27244	+0.06553
31	9.29451	0.6082	1.09428	1.18515	18	8.90671	0.6891	1.27281	9.90771
Feb. 1	9.28988	0.6073	1.10282	1.17823	19	8.88553	0.6912	1.27304	9.65727
2	9.28332	0.6056	1.11106	1.17106	20	8.86658	0.6946	1.27314	+8.99992
3	9.27487	0.6049	1.11902	1.16363	21	8.85169	0.6986	1.27311	-9.40495
<sup>h</sup> (9.0) 4	-9.26482	-0.6056	-1.12670	+1.15593	<sup>h</sup> (12.0) 22	-8.84205	-0.7026	-1.27295	-9.78378
5	9.25384	0.6082	1.13410	1.14796	23	8.83753	0.7059	1.27267	9.98281
6	9.24284	0.6126	1.14125	1.13971	24	8.83639	0.7078	1.27225	0.11861
7	9.23269	0.6187	1.14815	1.13116	25	8.83689	0.7082	1.27170	0.22176
8	9.22409	0.6255	1.15480	1.12230	26	8.83620	0.7070	1.27102	0.30490
9	-9.21743	-0.6323	-1.16122	+1.11312	27	-8.83219	-0.7045	-1.27021	-0.37451
10	9.21269	0.6381	1.16740	1.10361	28	8.82302	0.7014	1.26927	0.43434
11	9.20930	0.6426	1.17336	1.09375	29	8.80787	0.6982	1.26820	0.48678
12	9.20634	0.6452	1.17911	1.08353	30	8.78668	0.6957	1.26700	0.53342
13	9.20284	0.6460	1.18465	1.07293	31	8.76042	0.6945	1.26567	0.57540
14	-9.19794	-0.6454	-1.18998	+1.06192	Apr. 1	-8.73094	-0.6948	-1.26420	-0.61354
15	-9.19100	-0.6440	-1.19512	+1.05051	2	-8.70096	-0.6966	-1.26260	-0.64846

E = - 0".04 = - 0".002

[Eph 10]

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Apr. 1	-8.73094	-0.6948	-1.26420	-0.61354	May 17	+8.83493	-0.6750	-1.01636	-1.23111
2	8.70096	0.6966	1.26260	0.64846	18	8.84267	0.6751	1.00519	1.23587
3	8.67348	0.6995	1.26087	0.68065	19	8.84991	0.6736	0.99359	1.24046
4	8.65099	0.7028	1.25900	0.71049	20	8.85884	0.6706	0.98156	1.24488
h 5	8.63508	0.7059	1.25700	0.73827	h 21	8.87151	0.6664	0.96906	1.24913
(13.0) 6	-8.62500	-0.7081	-1.25486	-0.76425	(16.0) 22	+8.88852	-0.6618	-0.95608	-1.25321
7	8.61836	0.7088	1.25258	0.78862	23	8.90950	0.6575	0.94257	1.25714
8	8.61172	0.7079	1.25016	0.81157	24	8.93323	0.6544	0.92851	1.26090
9	8.60097	0.7056	1.24760	0.83323	25	8.95775	0.6528	0.91386	1.26452
10	8.58252	0.7021	1.24490	0.85374	26	8.98114	0.6531	0.89857	1.26798
11	-8.55315	-0.6981	-1.24205	-0.87318	27	+9.00208	-0.6550	-0.88260	-1.27129
12	8.51081	0.6945	1.23906	0.89165	28	9.01961	0.6580	0.86591	1.27446
13	8.45423	0.6917	1.23593	0.90924	29	9.03346	0.6612	0.84842	1.27748
14	8.38328	0.6903	1.23264	0.92602	30	9.04415	0.6640	0.83008	1.28036
15	8.29885	0.6906	1.22921	0.94203	31	9.05242	0.6656	0.81080	1.28309
16	-8.20575	-0.6922	-1.22562	-0.95735	June 1	+9.05971	-0.6657	-0.79051	-1.28569
17	8.11261	0.6948	1.22188	0.97201	2	9.06744	0.6641	0.76910	1.28816
18	8.03019	0.6976	1.21798	0.98606	3	9.07675	0.6611	0.74645	1.29048
19	7.96988	0.7000	1.21392	0.99954	4	9.08853	0.6571	0.72244	1.29268
h 20	7.93450	0.7012	1.20969	1.01249	h 5	9.10292	0.6530	0.69690	1.29474
(14.0) 21	-7.91328	-0.7008	-1.20530	-1.02493	(17.0) 6	+9.11939	-0.6496	-0.66963	-1.29667
22	7.88818	0.6989	1.20074	1.03689	7	9.13710	0.6475	0.64042	1.29847
23	7.83315	0.6956	1.19601	1.04841	8	9.15470	0.6472	0.60898	1.30015
24	7.71181	0.6914	1.19110	1.05950	9	9.17097	0.6487	0.57497	1.30169
25	-7.41830	0.6869	1.18602	1.07019	10	9.18520	0.6517	0.53794	1.30311
26	+6.86332	-0.6830	-1.18074	-1.08049	11	+9.19673	-0.6555	-0.49733	-1.30440
27	7.67394	0.6802	1.17528	1.09043	12	9.20548	0.6594	0.45241	1.30557
28	7.95569	0.6790	1.16963	1.10001	13	9.21195	0.6626	0.40218	1.30662
29	8.12418	0.6794	1.16378	1.10927	14	9.21672	0.6644	0.34526	1.30754
30	8.23477	0.6812	1.15772	1.11820	15	9.22097	0.6646	0.27960	1.30834
May 1	+8.30963	-0.6838	-1.15145	-1.12683	16	+9.22554	-0.6632	-0.20210	-1.30902
2	8.35889	0.6862	1.14497	1.13517	17	9.23152	0.6605	0.10758	1.30957
3	8.39182	0.6881	1.13827	1.14322	18	9.23935	0.6571	0.98645	1.31001
4	8.41531	0.6886	1.13134	1.15101	19	9.24910	0.6540	0.81775	1.31032
h 5	8.43569	0.6876	1.12417	1.15853	h 20	9.26043	0.6517	0.53800	1.31052
(15.0) 6	+8.45924	-0.6849	-1.11676	-1.16579	(18.0) 21	+9.27265	-0.6509	-0.51791	-1.31059
7	8.48996	0.6809	1.10910	1.17282	22	9.28490	0.6520	+0.44591	1.31054
8	8.52917	0.6763	1.10117	1.17960	23	9.29634	0.6548	0.77176	1.31037
9	8.57507	0.6717	1.09298	1.18616	24	9.30630	0.6589	0.95574	1.31008
10	8.62428	0.6679	1.08451	1.19249	25	9.31450	0.6636	0.08447	1.30968
11	+8.67274	-0.6655	-1.07575	-1.19861	26	+9.32096	-0.6680	+0.18354	-1.30915
12	8.71700	0.6649	1.06668	1.20452	27	9.32609	0.6715	0.26406	1.30850
13	8.75504	0.6658	1.05731	1.21022	28	9.33035	0.6735	0.33185	1.30772
14	8.78540	0.6680	1.04760	1.21573	29	9.33459	0.6739	0.39038	1.30683
15	8.80821	0.6708	1.03755	1.22104	30	9.33953	0.6728	0.44184	1.30581
16	+8.82413	-0.6734	-1.02715	-1.22617	July 1	+9.34573	-0.6706	+0.48774	-1.30468
17	+8.83493	-0.6750	-1.01636	-1.23111	2	+9.35338	-0.6681	+0.52914	-1.30341

$$E = -0''.04 = -0''.003$$

(CONSTANTS OF STRUVE AND PETERS.)

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
<b>July</b>					<b>Aug.</b>				
1	+ 9.34573	- 0.6706	+ 0.48774	- 1.30468	16	+ 9.57390	- 0.7462	+ 1.17784	- 1.08585
2	9.35338	0.6681	0.52914	1.30341	17	9.57838	0.7501	1.18316	1.07586
3	9.36239	0.6660	0.56683	1.30202	18	9.58206	0.7548	1.18829	1.06550
4	9.37238	0.6650	0.60140	1.30051	19	9.58482	0.7597	1.19325	1.05476
5	9.38269	0.6656	0.63331	1.29887	20	9.58670	0.7641	1.19802	1.04361
<sup>h</sup> (10.0)					<sup>h</sup> (22.0)				
6	+ 9.39259	- 0.6680	+ 0.66292	- 1.29711	21	+ 9.58797	- 0.7674	+ 1.20263	- 1.03204
7	9.40152	0.6719	0.69053	1.29521	22	9.58893	0.7695	1.20707	1.02003
8	9.40892	0.6768	0.71638	1.29319	23	9.59004	0.7702	1.21135	1.00754
9	9.41467	0.6820	0.74065	1.29104	24	9.59166	0.7697	1.21546	0.99454
10	9.41891	0.6867	0.76353	1.28875	25	9.59405	0.7685	1.21941	0.98102
11	+ 9.42195	- 0.6903	+ 0.78515	- 1.28634	26	+ 9.59735	- 0.7671	+ 1.22321	- 0.96692
12	9.42442	0.6924	0.80563	1.28378	27	9.60144	0.7662	1.22686	0.95221
13	9.42689	0.6928	0.82507	1.28109	28	9.60608	0.7664	1.23035	0.93686
14	9.42998	0.6920	0.84357	1.27827	29	9.61080	0.7678	1.23370	0.92080
15	9.43414	0.6903	0.86119	1.27530	30	9.61522	0.7705	1.23690	0.90398
16	+ 9.43955	- 0.6886	+ 0.87801	- 1.27219	31	+ 9.61902	- 0.7742	+ 1.23995	- 0.88636
17	9.44613	0.6874	0.89409	1.26894	<b>Sept.</b>				
18	9.45347	0.6875	0.90948	1.26554	1	9.62191	0.7785	1.24286	0.86784
19	9.46108	0.6893	0.92423	1.26199	2	9.62380	0.7826	1.24563	0.84836
20	9.46838	0.6926	0.93837	1.25829	3	9.62482	0.7862	1.24826	0.82783
<sup>h</sup> (30.0)					<sup>h</sup> (23.0)				
21	+ 9.47484	- 0.6972	+ 0.95196	- 1.25444	5	+ 9.62541	- 0.7897	+ 1.25311	- 0.78316
22	9.48022	0.7026	0.96502	1.25044	6	9.62574	0.7895	1.25533	0.75876
23	9.48441	0.7079	0.97758	1.24627	7	9.62663	0.7884	1.25742	0.73275
24	9.48756	0.7125	0.98968	1.24194	8	9.62826	0.7866	1.25937	0.70495
25	9.49000	0.7158	1.00133	1.23744	9	9.63071	0.7850	1.26119	0.67509
26	+ 9.49220	- 0.7177	+ 1.01257	- 1.23277	10	+ 9.63391	- 0.7840	+ 1.26288	- 0.64288
27	9.49478	0.7181	1.02340	1.22793	11	9.63753	0.7840	1.26443	0.60794
28	9.49807	0.7173	1.03386	1.22290	12	9.64126	0.7853	1.26586	0.56978
29	9.50243	0.7160	1.04396	1.21770	13	9.64468	0.7877	1.26716	0.52778
30	9.50782	0.7148	1.05371	1.21231	14	9.64756	0.7910	1.26833	0.48113
31	+ 9.51407	- 0.7144	+ 1.06313	- 1.20673	15	+ 9.64971	- 0.7947	+ 1.26937	- 0.42868
<b>Aug.</b>					16	9.65110	0.7980	1.27029	0.36884
1	9.52064	0.7153	1.07224	1.20096	17	9.65187	0.8006	1.27108	0.29923
2	9.52732	0.7177	1.08104	1.19496	18	9.65230	0.8020	1.27174	0.21609
3	9.53336	0.7216	1.08956	1.18877	19	9.65276	0.8021	1.27227	0.11296
4	9.53847	0.7265	1.09779	1.18236	<sup>h</sup> (0.0)				
5	+ 9.54240	- 0.7317	+ 1.10575	- 1.17574	20	+ 9.65360	- 0.8010	+ 1.27268	- 9.97718
<sup>h</sup> (21.0)					21	9.65508	0.7990	1.27296	9.77822
6	9.54512	0.7368	1.11345	1.16888	22	9.65734	0.7967	1.27311	- 9.39962
7	9.54687	0.7409	1.12090	1.16179	23	9.66039	0.7946	1.27314	+ 8.99320
8	9.54802	0.7437	1.12811	1.15445	24	9.66401	0.7934	1.27304	9.65134
9	9.54903	0.7451	1.13508	1.14687	25	+ 9.66790	- 0.7932	+ 1.27282	+ 9.90188
10	+ 9.55033	- 0.7451	+ 1.14182	- 1.13902	26	9.67168	0.7943	1.27246	0.05975
11	9.55238	0.7443	1.14835	1.13090	27	9.67500	0.7964	1.27198	0.17525
12	9.55538	0.7430	1.15465	1.12250	28	9.67762	0.7992	1.27137	0.26634
13	9.55929	0.7422	1.16075	1.11381	29	9.67939	0.8022	1.27063	0.34154
14	9.56395	0.7422	1.16664	1.10481	30	+ 9.68040	0.8047	+ 1.26976	+ 0.40554
15	+ 9.56894	- 0.7434	+ 1.17234	- 1.09550	<b>Oct.</b>				
16	+ 9.57390	- 0.7462	+ 1.17784	- 1.08585	1	+ 9.68081	- 0.8063	+ 1.26876	+ 0.46123

E = - 0".03 = - 0".002

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Oct. 1	+9.68081	-0.8063	+1.26876	+0.46123	Nov. 16	+9.77273	-0.7688	+1.04248	+1.21848
2	9.68090	0.8066	1.26762	0.51050	17	9.77613	0.7655	1.03177	1.22394
3	9.68105	0.8057	1.26636	0.55465	18	9.77994	0.7632	1.02064	1.22919
4	9.68157	0.8036	1.26496	0.59463	h 19	9.78383	0.7623	1.00908	1.23426
5	9.68277	0.8010	1.26343	0.63114	(4.0) 20	9.78756	0.7627	0.99705	1.23913
h (1.0) 6	+9.68471	-0.7981	+1.26176	+0.66472	21	+9.79088	-0.7642	+0.98454	+1.24381
7	9.68733	0.7956	1.25996	0.69578	22	9.79363	0.7664	0.97152	1.24832
8	9.69047	0.7941	1.25801	0.72466	23	9.79574	0.7685	0.95794	1.25265
9	9.69382	0.7938	1.25593	0.75163	24	9.79730	0.7700	0.94378	1.25680
10	9.69706	0.7947	1.25371	0.77691	25	9.79846	0.7705	0.92899	1.26078
11	+9.69990	-0.7965	+1.25134	+0.80069	26	+9.79952	-0.7696	+0.91354	+1.26459
12	9.70214	0.7989	1.24883	0.82312	27	9.80071	0.7675	0.89737	1.26824
13	9.70370	0.8012	1.24617	0.84434	28	9.80228	0.7644	0.88042	1.27172
14	9.70470	0.8029	1.24336	0.86446	29	9.80438	0.7608	0.86264	1.27504
15	9.70533	0.8035	1.24041	0.88357	30	9.80704	0.7573	0.84395	1.27820
16	+9.70591	-0.8029	+1.23730	+0.90176	Dec. 1	+9.81022	-0.7546	+0.82428	+1.28121
17	9.70674	0.8010	1.23404	0.91910	2	9.81362	0.7531	0.80351	1.28406
18	9.70813	0.7982	1.23061	0.93566	3	9.81712	0.7531	0.78155	1.28676
19	9.71019	0.7948	1.22703	0.95149	h 4	9.82044	0.7544	0.75829	1.28930
20	9.71298	0.7915	1.22328	0.96665	(5.0) 5	9.82339	0.7567	0.73354	1.29170
h (2.0) 21	+9.71637	-0.7888	+1.21937	+0.98118	6	+9.82584	-0.7594	+0.70716	+1.29394
22	9.72010	0.7872	1.21528	0.99512	7	9.82780	0.7619	0.67891	1.29604
23	9.72389	0.7868	1.21102	1.00851	8	9.82936	0.7636	0.64854	1.29800
24	9.72737	0.7877	1.20659	1.02138	9	9.83073	0.7642	0.61574	1.29981
25	9.73028	0.7894	1.20197	1.03376	10	9.83214	0.7634	0.58011	1.30147
26	+9.73252	-0.7914	+1.19717	+1.04568	11	+9.83379	-0.7614	+0.54113	+1.30300
27	9.73406	0.7932	1.19218	1.05715	12	9.83592	0.7586	0.49814	1.30438
28	9.73501	0.7943	1.18699	1.06821	13	9.83854	0.7555	0.45027	1.30562
29	9.73566	0.7942	1.18160	1.07887	14	9.84168	0.7529	0.39630	1.30673
30	9.73617	0.7927	1.17600	1.08915	15	9.84521	0.7511	0.33449	1.30769
31	+9.73698	-0.7901	+1.17020	+1.09907	16	+9.84891	0.7508	+0.26222	+1.30851
Nov. 1	9.73832	0.7867	1.16418	1.10865	17	9.85252	0.7518	0.17529	1.30920
2	9.74034	0.7829	1.15794	1.11789	18	9.85580	0.7542	0.06629	1.30975
3	9.74299	0.7794	1.15147	1.12681	19	9.85865	0.7574	0.92019	1.31016
4	9.74617	0.7767	1.14476	1.13543	20	9.86092	0.7608	0.69813	1.31044
h (3.0) 5	+9.74961	-0.7753	+1.13781	+1.14375	h (6.0) 21	+9.86266	-0.7638	+0.21936	+1.31057
6	9.75305	0.7751	1.13061	1.15179	22	9.86402	0.7658	-0.22462	1.31057
7	9.75623	0.7762	1.12314	1.15956	23	9.86516	0.7666	0.69999	1.31043
8	9.75891	0.7779	1.11541	1.16706	24	9.86634	0.7660	0.92144	1.31016
9	9.76102	0.7799	1.10740	1.17431	25	9.86775	0.7644	0.06731	1.30975
10	+9.76260	-0.7814	+1.09910	+1.18130	26	+9.86958	-0.7622	-0.17623	+1.30920
11	9.76381	0.7820	1.09050	1.18806	27	9.87187	0.7599	0.26312	1.30851
12	9.76489	0.7814	1.08158	1.19459	28	9.87461	0.7582	0.33540	1.30768
13	9.76610	0.7795	1.07233	1.20088	29	9.87762	0.7577	0.39722	1.30671
14	9.76771	0.7764	1.06274	1.20696	30	9.88075	0.7585	0.45121	1.30560
15	+9.76990	-0.7727	+1.05280	+1.21283	31	+9.88375	-0.7601	-0.49911	+1.30435
16	+9.77273	-0.7688	+1.04248	+1.21848	32	+9.88641	-0.7615	-0.54212	+1.30296

E = - 0".03 = - 0".002



(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$ In Time.	$f'$ In Time.	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .	
	$y$	$s$	$s$	$^{\circ}$	$h\ m$	$^{\circ}$	$h\ m$			"		
Jan.	0	-0.0001	-0.916	-0.927	209 36.8	13 58.5	350 52.5	23 23.5	+0.83598	+1.30956	-1.40	-0.1471
	1	+0.0027	0.910	0.915	210 0.5	14 0.0	349 56.1	23 19.7	0.83495	1.30934	1.55	0.1891
	2	0.0054	0.905	0.903	210 15.5	14 1.0	348 59.6	23 16.0	0.83366	1.30911	1.69	0.2272
	3	0.0082	0.900	0.892	210 24.0	14 1.6	348 3.1	23 12.2	0.83165	1.30884	1.83	0.2622
h	4	0.0109	0.893	0.881	210 29.2	14 1.9	347 6.5	23 8.4	0.82860	1.30856	1.97	0.2944
(7.0)	5	0.0136	-0.883	-0.869	210 35.2	14 2.3	346 9.9	23 4.7	+0.82446	+1.30826	-2.11	-0.3242
	6	0.0164	0.871	0.858	210 46.4	14 3.1	345 13.1	23 0.9	0.81935	1.30794	2.25	0.3520
	7	0.0191	0.857	0.846	211 6.3	14 4.4	344 16.3	22 57.1	0.81361	1.30761	2.39	0.3780
	8	0.0218	0.841	0.835	211 36.8	14 6.5	343 19.3	22 53.3	0.80777	1.30725	2.53	0.4024
	9	0.0246	0.824	0.824	212 17.7	14 9.2	342 22.3	22 49.5	0.80237	1.30687	2.66	0.4254
	10	0.0273	-0.808	-0.813	213 6.8	14 12.5	341 25.2	22 45.7	+0.79787	+1.30648	-2.80	-0.4471
	11	0.0301	0.794	0.802	214 0.1	14 16.0	340 27.9	22 41.9	0.79455	1.30607	2.94	0.4676
	12	0.0328	0.782	0.791	214 52.5	14 19.5	339 30.6	22 38.0	0.79246	1.30564	3.07	0.4871
	13	0.0355	0.774	0.780	215 39.4	14 22.6	338 33.2	22 34.2	0.79132	1.30519	3.20	0.5056
	14	0.0383	0.765	0.769	216 17.9	14 25.2	337 35.6	22 30.4	0.79063	1.30473	3.34	0.5232
	15	0.0410	-0.759	-0.758	216 47.0	14 27.1	336 37.9	22 26.5	+0.78983	+1.30426	-3.47	-0.5400
	16	0.0438	0.753	0.747	217 7.7	14 28.5	335 40.2	22 22.7	0.78833	1.30376	3.60	0.5560
	17	0.0465	0.746	0.737	217 23.0	14 29.5	334 42.3	22 18.8	0.78582	1.30325	3.73	0.5713
	18	0.0492	0.737	0.726	217 37.4	14 30.5	333 44.2	22 14.9	0.78210	1.30273	3.85	0.5859
h	19	0.0520	0.726	0.716	217 55.5	14 31.7	332 46.1	22 11.1	0.77726	1.30220	3.98	0.6000
(8.0)	20	0.0547	-0.713	-0.706	218 21.3	14 33.4	331 47.8	22 7.2	+0.77165	+1.30165	-4.11	-0.6135
	21	0.0574	0.698	0.695	218 57.4	14 35.8	330 49.4	22 3.3	0.76584	1.30109	4.23	0.6264
	22	0.0602	0.681	0.685	219 44.4	14 38.9	329 50.8	21 59.4	0.76048	1.30052	4.35	0.6388
	23	0.0629	0.665	0.675	220 40.4	14 42.7	328 52.1	21 55.5	0.75615	1.29993	4.47	0.6507
	24	0.0657	0.651	0.665	221 41.5	14 46.8	327 53.3	21 51.6	0.75328	1.29934	4.59	0.6622
	25	0.0684	-0.639	-0.655	222 42.2	14 50.8	326 54.3	21 47.6	+0.75199	+1.29874	-4.71	-0.6733
	26	0.0711	0.629	0.645	223 37.0	14 54.5	325 55.2	21 43.7	0.75209	1.29812	4.83	0.6839
	27	0.0739	0.623	0.635	224 22.0	14 57.5	324 55.9	21 39.7	0.75303	1.29750	4.95	0.6941
	28	0.0766	0.618	0.626	224 55.6	14 59.7	323 56.4	21 35.8	0.75417	1.29687	5.06	0.7040
	29	0.0794	0.615	0.616	225 18.5	15 1.2	322 56.8	21 31.8	0.75487	1.29624	5.17	0.7135
	30	0.0821	-0.612	-0.607	225 33.7	15 2.2	321 57.0	21 27.8	+0.75457	+1.29560	-5.28	-0.7227
	31	0.0848	0.608	0.597	225 45.6	15 3.0	320 57.1	21 23.8	0.75301	1.29495	5.39	0.7316
Feb.	1	0.0876	0.601	0.588	225 59.2	15 3.9	319 57.0	21 19.8	0.75020	1.29430	5.50	0.7401
	2	0.0903	0.592	0.579	226 19.5	15 5.3	318 56.7	21 15.8	0.74629	1.29364	5.60	0.7484
h	3	0.0930	0.581	0.570	226 50.2	15 7.4	317 56.2	21 11.7	0.74191	1.29298	5.71	0.7563
(9.0)	4	0.0958	-0.568	-0.561	227 32.7	15 10.2	316 55.6	21 7.7	+0.73765	+1.29232	-5.81	-0.7640
	5	0.0985	0.554	0.552	228 25.9	15 13.7	315 54.8	21 3.7	0.73413	1.29166	5.91	0.7714
	6	0.1012	0.540	0.543	229 26.6	15 17.8	314 53.9	20 59.6	0.73194	1.29099	6.01	0.7786
	7	0.1040	0.527	0.534	230 29.7	15 22.0	313 52.8	20 55.5	0.73128	1.29033	6.10	0.7854
	8	0.1067	0.517	0.526	231 29.4	15 26.0	312 51.5	20 51.4	0.73200	1.28967	6.20	0.7921
	9	0.1095	-0.509	-0.517	232 20.8	15 29.4	311 50.0	20 47.3	+0.73368	+1.28901	-6.29	-0.7985
	10	0.1122	0.504	0.509	233 1.4	15 32.1	310 48.4	20 43.2	0.73565	1.28835	6.38	0.8047
	11	0.1149	0.500	0.501	233 31.3	15 34.1	309 46.6	20 39.1	0.73728	1.28770	6.47	0.8107
	12	0.1177	0.496	0.492	233 52.4	15 35.5	308 44.7	20 35.0	0.73790	1.28705	6.55	0.8164
	13	0.1204	0.493	0.484	234 8.5	15 36.6	307 42.7	20 30.8	0.73723	1.28641	6.64	0.8220
	14	0.1232	-0.487	-0.476	234 24.5	15 37.6	306 40.4	20 26.7	+0.73517	+1.28577	-6.72	-0.8273
	15	0.1259	-0.479	-0.468	234 45.4	15 39.0	305 37.9	20 22.5	+0.73193	+1.28515	-6.80	-0.8324

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f$		$f'$		$G$		$H$		$\log g.$	$\log h.$	$i$	$\log i.$
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.	$\log g.$	$\log h.$	$i$	$\log i.$		
		y	s	s	°	h m	°	h m						
Feb.	15	0.1259	-0.479	-0.468	234 45.4	15 39.0	305 37.9	20 22.5	+0.73193	+1.28515	-6.80	-0.8324		
	16	0.1286	0.469	0.460	235 15.2	15 41.0	304 35.4	20 18.4	0.72793	1.28452	6.88	0.8374		
	17	0.1314	0.457	0.453	235 56.1	15 43.8	303 32.7	20 14.2	0.72388	1.28391	6.95	0.8421		
	18	0.1341	0.443	0.445	236 47.5	15 47.2	302 29.9	20 10.0	0.72051	1.28331	7.02	0.8466		
	h	19	0.1368	0.430	0.437	237 46.3	15 51.1	301 26.9	0.71845	1.28272	7.10	0.8510		
	(10.0)	20	0.1396	-0.417	-0.430	238 47.6	15 55.2	300 23.8	0.71803	+1.28214	-7.17	-0.8552		
	21	0.1423	0.407	0.422	239 45.7	15 59.0	299 20.5	19 57.4	0.71921	1.28157	7.23	0.8592		
	22	0.1451	0.399	0.415	240 35.2	16 2.3	298 17.2	19 53.1	0.72167	1.28101	7.30	0.8631		
	23	0.1478	0.394	0.408	241 12.6	16 4.8	297 13.7	19 48.9	0.72472	1.28047	7.36	0.8668		
	24	0.1505	0.392	0.401	241 37.2	16 6.5	296 10.0	19 44.7	0.72771	1.27994	7.42	0.8703		
Mar.	25	0.1533	-0.391	-0.394	241 51.0	16 7.4	295 6.2	19 40.4	+0.72988	+1.27943	-7.48	-0.8736		
	26	0.1560	0.390	0.387	241 57.7	16 7.9	294 2.4	19 36.2	0.73081	1.27893	7.53	0.8768		
	27	0.1588	0.388	0.380	242 2.3	16 8.1	292 58.4	19 31.9	0.73029	1.27845	7.58	0.8799		
	28	0.1615	0.385	0.373	242 10.0	16 8.7	291 54.2	19 27.6	0.72839	1.27798	7.63	0.8828		
	1	0.1642	0.379	0.366	242 25.3	16 9.7	290 50.0	19 23.3	0.72549	1.27754	7.68	0.8855		
	2	0.1670	-0.371	-0.359	242 51.2	16 11.4	289 45.7	19 19.0	+0.72218	+1.27711	-7.73	-0.8881		
	3	0.1697	0.361	0.352	243 28.9	16 13.9	288 41.3	19 14.7	0.71915	1.27671	7.77	0.8905		
	4	0.1724	0.349	0.346	244 16.7	16 17.1	287 36.8	19 10.5	0.71704	1.27632	7.81	0.8928		
	5	0.1752	0.337	0.339	245 10.2	16 20.7	286 32.2	19 6.2	0.71633	1.27595	7.85	0.8949		
	h	6	0.1779	0.326	0.332	246 4.1	16 24.3	285 27.5	0.71715	1.27560	7.89	0.8969		
(11.0)	7	0.1806	-0.318	-0.320	246 53.1	16 27.5	284 22.8	18 57.5	+0.71928	+1.27528	-7.92	-0.8988		
	8	0.1834	0.311	0.319	247 33.1	16 30.2	283 18.0	18 53.2	0.72221	1.27497	7.95	0.9005		
	9	0.1861	0.307	0.313	248 2.1	16 32.2	282 13.1	18 48.9	0.72518	1.27469	7.98	0.9020		
	10	0.1889	0.305	0.306	248 20.6	16 33.4	281 8.2	18 44.5	0.72756	1.27443	8.01	0.9035		
	11	0.1916	0.303	0.300	248 31.4	16 34.1	280 3.2	18 40.2	0.72877	1.27420	8.03	0.9048		
	12	0.1943	-0.301	-0.297	248 38.7	16 34.6	278 58.3	18 35.9	+0.72850	+1.27398	-8.05	-0.9059		
	13	0.1971	0.298	0.287	248 47.6	16 35.2	277 53.3	18 31.6	0.72669	1.27380	8.07	0.9070		
	14	0.1998	0.293	0.281	249 2.7	16 36.2	276 48.3	18 27.2	0.72369	1.27363	8.09	0.9079		
	15	0.2026	0.285	0.275	249 27.3	16 37.8	275 43.2	18 22.9	0.71998	1.27349	8.10	0.9086		
	16	0.2053	0.275	0.269	250 3.0	16 40.2	274 38.2	18 18.5	0.71628	1.27337	8.11	0.9092		
h	17	0.2080	-0.261	-0.262	250 48.9	16 43.3	273 33.2	18 14.2	+0.71328	+1.27328	-8.12	-0.9098		
	18	0.2108	0.250	0.256	251 41.4	16 46.7	272 28.2	18 9.9	0.71163	1.27321	8.13	0.9101		
	19	0.2135	0.239	0.250	252 35.1	16 50.3	271 23.2	18 5.5	0.71159	1.27317	8.14	0.9103		
	20	0.2162	0.229	0.244	253 24.5	16 53.6	270 18.3	18 1.2	0.71304	1.27315	8.14	0.9105		
	h	21	0.2190	0.221	0.237	254 4.8	16 56.3	269 13.4	0.71559	1.27315	8.14	0.9104		
	(12.0)	22	0.2217	-0.216	-0.231	254 32.8	16 58.2	268 8.6	+0.71859	+1.27318	-8.13	-0.9103		
	23	0.2245	0.214	0.225	254 48.5	16 59.2	267 3.8	17 48.3	0.72131	1.27324	8.13	0.9100		
	24	0.2272	0.213	0.219	254 54.4	16 59.6	265 59.0	17 43.9	0.72307	1.27332	8.12	0.9096		
	25	0.2299	0.214	0.212	254 54.5	16 59.6	264 54.4	17 39.6	0.72344	1.27342	8.11	0.9090		
	26	0.2327	0.213	0.206	254 53.5	16 59.6	263 49.8	17 35.3	0.72229	1.27354	8.10	0.9083		
h	27	0.2354	-0.211	-0.200	254 56.6	16 59.8	262 45.3	17 31.0	+0.71971	+1.27369	-8.08	-0.9075		
	28	0.2382	0.207	0.194	255 8.4	17 0.6	261 40.8	17 26.7	0.71615	1.27387	8.06	0.9066		
	29	0.2409	0.200	0.187	255 31.6	17 2.1	260 36.4	17 22.4	0.71219	1.27406	8.04	0.9055		
	30	0.2436	0.191	0.181	256 6.8	17 4.5	259 32.2	17 18.1	0.70859	1.27428	8.02	0.9043		
	31	0.2464	0.180	0.174	256 51.8	17 7.5	258 28.0	17 13.9	0.70600	1.27452	8.00	0.9030		
	Apr.	1	0.2491	-0.168	-0.168	257 42.4	17 10.8	257 24.0	17 9.6	+0.70490	+1.27479	-7.97	-0.9015	
	2	0.2518	0.157	-0.162	258 33.1	17 14.2	256 20.0	17 5.3	+0.70536	+1.27508	-7.94	-0.8999		

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
		$y$	$s$	$s$	$^{\circ}$	$h\ m$	$^{\circ}$	$h\ m$						
Apr.	1	0.2491	-0.168	-0.168	257 42.4	17 10.8	257 24.0	17 9.6	+0.70490	+1.27479	-7.97	-0.9015		
	2	0.2518	0.157	0.162	258 33.1	17 14.2	256 20.0	17 5.3	0.70536	1.27508	7.94	0.8999		
	3	0.2546	0.147	0.155	259 18.5	17 17.2	255 16.2	17 1.1	0.70712	1.27538	7.91	0.8982		
	4	0.2573	0.140	0.149	259 54.6	17 19.6	254 12.5	16 56.8	0.70961	1.27571	7.88	0.8963		
	5	0.2600	0.135	0.142	260 20.0	17 21.3	253 9.0	16 52.6	0.71212	1.27606	7.84	0.8943		
	(13.0)	-6	0.2628	-0.132	-0.135	260 35.8	17 22.4	252 5.5	16 48.4	+0.71393	+1.27642	-7.80	-0.8922	
	7	0.2655	0.130	0.129	260 45.1	17 23.0	251 2.2	16 44.1	0.71448	1.27681	7.76	0.8899		
	8	0.2683	0.128	0.122	260 52.3	17 23.5	249 59.1	16 39.9	0.71345	1.27721	7.72	0.8875		
	9	0.2710	0.125	0.115	261 2.6	17 24.2	248 56.1	16 35.7	0.71088	1.27764	7.67	0.8849		
	10	0.2737	0.120	0.108	261 20.6	17 25.4	247 53.3	16 31.6	0.70708	1.27808	7.62	0.8822		
	11	0.2765	-0.112	-0.101	261 49.7	17 27.3	246 50.7	16 27.4	+0.70257	+1.27853	-7.57	-0.8794		
	12	0.2792	0.102	0.095	262 31.0	17 30.1	245 48.2	16 23.2	0.69817	1.27900	7.52	0.8764		
	13	0.2820	0.090	0.088	263 22.8	17 33.5	244 45.9	16 19.1	0.69460	1.27949	7.47	0.8732		
	14	0.2847	0.077	0.080	264 21.2	17 37.4	243 43.7	16 14.9	0.69245	1.27999	7.41	0.8700		
	15	0.2874	0.064	0.073	265 20.9	17 41.4	242 41.8	16 10.8	0.69201	1.28051	7.35	0.8665		
	16	0.2902	-0.052	-0.066	266 15.4	17 45.0	241 40.1	16 6.7	+0.69314	+1.28104	-7.29	-0.8629		
	17	0.2929	0.042	0.059	266 59.8	17 48.0	240 38.5	16 2.6	0.69539	1.28157	7.23	0.8592		
	18	0.2956	0.036	0.051	267 31.8	17 50.1	239 37.1	15 58.5	0.69802	1.28213	7.17	0.8553		
	19	0.2984	0.031	0.044	267 51.7	17 51.4	238 36.0	15 54.4	0.70025	1.28269	7.10	0.8512		
	20	0.3011	0.029	0.036	268 2.1	17 52.1	237 35.0	15 50.3	0.70142	1.28326	7.03	0.8470		
h (14.0)	21	0.3039	-0.028	-0.029	268 7.6	17 52.5	236 34.2	15 46.3	+0.70107	+1.28384	-6.96	-0.8426		
	22	0.3066	0.026	0.021	268 13.4	17 52.9	235 33.6	15 42.2	0.69914	1.28443	6.89	0.8380		
	23	0.3093	0.024	0.014	268 25.4	17 53.7	234 33.3	15 38.2	0.69579	1.28504	6.81	0.8333		
	24	0.3121	0.018	-0.006	268 47.8	17 55.2	233 33.1	15 34.2	0.69149	1.28564	6.74	0.8284		
	25	0.3148	-0.011	+0.002	269 22.8	17 57.5	232 33.1	15 30.2	0.68696	1.28625	6.66	0.8233		
	26	0.3176	0.000	+0.010	270 10.3	18 0.7	231 33.3	15 26.2	+0.68299	+1.28687	-6.58	-0.8181		
	27	0.3203	+0.012	0.018	271 7.8	18 4.5	230 33.7	15 22.2	0.68028	1.28749	6.50	0.8126		
	28	0.3230	0.025	0.027	272 10.3	18 8.7	229 34.3	15 18.3	0.67931	1.28811	6.41	0.8069		
	29	0.3258	0.038	0.035	273 11.7	18 12.8	228 35.2	15 14.4	0.68011	1.28874	6.32	0.8011		
	30	0.3285	0.050	0.043	274 6.2	18 16.4	227 36.2	15 10.4	0.68231	1.28938	6.24	0.7950		
	May	1	0.3312	+0.060	+0.052	274 50.5	18 19.4	226 37.4	15 6.5	+0.68537	+1.29007	-6.15	-0.7888	
	2	0.3340	0.068	0.060	275 23.4	18 21.6	225 38.8	15 2.6	0.68817	1.29064	6.06	0.7823		
	3	0.3367	0.075	0.069	275 47.3	18 23.2	224 40.4	14 58.7	0.69030	1.29128	5.96	0.7756		
	4	0.3395	0.077	0.077	276 6.1	18 24.4	223 42.2	14 54.8	0.69110	1.29191	5.87	0.7686		
	5	0.3422	0.081	0.086	276 24.4	18 25.6	222 44.2	14 50.9	0.69027	1.29254	5.77	0.7615		
	h (15.0)	6	0.3449	+0.086	+0.095	276 48.1	18 27.2	221 46.3	14 47.1	+0.68796	+1.29317	-5.68	-0.7541	
	7	0.3477	0.092	0.104	277 21.6	18 29.4	220 48.7	14 43.2	0.68453	1.29380	5.58	0.7464		
8	0.3504	0.101	0.113	278 7.9	18 32.5	219 51.3	14 39.4	0.68070	1.29442	5.48	0.7385			
9	0.3531	0.113	0.122	279 7.1	18 36.5	218 54.0	14 35.6	0.67725	1.29504	5.37	0.7303			
10	0.3559	0.127	0.131	280 16.7	18 41.1	217 57.0	14 31.8	0.67495	1.29566	5.27	0.7218			
11	0.3586	+0.142	+0.140	281 31.4	18 46.1	217 0.1	14 28.0	+0.67438	+1.29627	-5.17	-0.7130			
12	0.3614	0.157	0.150	282 44.6	18 51.0	216 3.4	14 24.2	0.67569	1.29687	5.06	0.7040			
13	0.3641	0.172	0.159	283 50.0	18 55.3	215 6.9	14 20.5	0.67862	1.29747	4.95	0.6946			
14	0.3668	0.185	0.169	284 43.2	18 58.9	214 10.6	14 16.7	0.68254	1.29806	4.84	0.6849			
15	0.3696	0.195	0.179	285 22.8	19 1.5	213 14.5	14 13.0	0.68666	1.29864	4.73	0.6749			
16	0.3723	+0.202	+0.188	285 50.4	19 3.4	212 18.5	14 9.2	+0.69019	+1.29922	-4.62	-0.6644			
17	0.3750	+0.207	+0.198	286 9.7	19 4.6	211 22.7	14 5.5	+0.69248	+1.29978	-4.51	-0.6537			

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f$		$f'$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	s	s	h m	h m	h m	h m				
May	17	0.3750	+0.207	+0.198	286	9.7	19 4.6	211 22.7	14 5.5	+0.69248	+1.29978	-4.51	-0.6537
	18	0.3778	0.211	0.208	286	25.9	19 5.7	210 27.1	14 1.8	0.69324	1.30034	4.39	0.6425
	19	0.3805	0.215	0.218	286	44.8	19 7.0	209 31.7	13 58.1	0.69245	1.30088	4.28	0.6309
	20	0.3833	0.219	0.228	287	11.4	19 8.7	208 36.4	13 54.4	0.69042	1.30142	4.16	0.6189
	21	0.3860	0.226	0.238	287	49.5	19 11.3	207 41.2	13 50.7	0.68777	1.30194	4.04	0.6064
(16.0)	22	0.3887	+0.235	+0.248	288	40.3	19 14.7	206 46.3	13 47.1	+0.68530	+1.30245	-3.92	-0.5934
	23	0.3915	0.247	0.258	289	42.4	19 18.8	205 51.5	13 43.4	0.68375	1.30295	3.80	0.5799
	24	0.3942	0.261	0.269	290	51.5	19 23.4	204 56.8	13 39.8	0.68382	1.30344	3.68	0.5658
	25	0.3970	0.276	0.279	292	1.6	19 28.1	204 2.2	13 36.1	0.68577	1.30392	3.56	0.5512
	26	0.3997	0.292	0.290	293	6.6	19 32.4	203 7.8	13 32.5	0.68945	1.30437	3.44	0.5359
	27	0.4024	+0.306	+0.300	294	1.9	19 36.1	202 13.5	13 28.9	+0.69437	+1.30482	-3.31	-0.5199
	28	0.4052	0.319	0.311	294	45.3	19 39.0	201 19.4	13 25.3	0.69982	1.30525	3.19	0.5032
	29	0.4079	0.329	0.321	295	17.4	19 41.1	200 25.3	13 21.7	0.70495	1.30567	3.06	0.4857
	30	0.4106	0.338	0.332	295	41.5	19 42.8	199 31.4	13 18.1	0.70922	1.30607	2.93	0.4674
	31	0.4134	0.344	0.343	296	2.3	19 44.2	198 37.6	13 14.5	0.71211	1.30646	2.81	0.4481
June	1	0.4161	+0.350	+0.354	296	25.0	19 45.7	197 43.9	13 10.9	+0.71360	+1.30683	-2.68	-0.4278
	2	0.4188	0.356	0.365	296	54.6	19 47.6	196 50.3	13 7.4	0.71386	1.30719	2.55	0.4064
	3	0.4216	0.364	0.376	297	34.5	19 50.3	195 56.8	13 3.8	0.71342	1.30753	2.42	0.3838
	4	0.4243	0.374	0.387	298	26.0	19 53.7	195 3.4	13 0.2	0.71293	1.30785	2.29	0.3597
	5	0.4271	0.387	0.398	299	27.8	19 57.9	194 10.1	12 56.7	0.71318	1.30815	2.16	0.3342
(17.0)	6	0.4298	+0.402	+0.409	300	36.2	20 2.4	193 16.8	12 53.1	+0.71473	+1.30844	-2.03	-0.3069
	7	0.4325	0.419	0.420	301	45.6	20 7.0	192 23.7	12 49.6	0.71794	1.30872	1.90	0.2777
	8	0.4353	0.436	0.431	302	49.7	20 11.3	191 30.6	12 46.0	0.72274	1.30897	1.76	0.2463
	9	0.4380	0.453	0.442	303	43.5	20 14.9	190 37.6	12 42.5	0.72870	1.30920	1.63	0.2123
	10	0.4408	0.468	0.453	304	24.5	20 17.5	189 44.6	12 39.0	0.73522	1.30942	1.50	0.1753
	11	0.4435	+0.481	+0.464	304	52.8	20 19.5	188 51.8	12 35.5	+0.74154	+1.30962	-1.36	-0.1346
	12	0.4462	0.491	0.476	305	11.0	20 20.7	187 58.9	12 31.9	0.74703	1.30980	1.23	0.0897
	13	0.4490	0.498	0.487	305	23.3	20 21.6	187 6.2	12 28.4	0.75128	1.30996	1.10	0.0395
	14	0.4517	0.504	0.498	305	34.6	20 22.3	186 13.5	12 24.9	0.75412	1.31011	0.96	0.9826
	15	0.4544	0.509	0.510	305	49.7	20 23.3	185 20.8	12 21.4	0.75569	1.31024	0.83	0.9169
	16	0.4572	+0.514	+0.521	306	12.4	20 24.8	184 28.2	12 17.9	+0.75634	+1.31034	-0.69	-0.8394
	17	0.4599	0.521	0.532	306	45.0	20 27.0	183 35.6	12 14.4	0.75671	1.31043	0.56	0.7449
	18	0.4627	0.531	0.544	307	27.5	20 29.8	182 43.1	12 10.9	0.75743	1.31050	0.42	0.6238
	19	0.4654	0.543	0.555	308	17.2	20 33.1	181 50.6	12 7.4	0.75912	1.31055	0.29	0.4551
	20	0.4681	0.557	0.566	309	9.8	20 36.7	180 58.0	12 3.9	0.76217	1.31058	0.15	0.1753
(18.0)	21	0.4709	+0.573	+0.578	310	0.2	20 40.0	180 5.5	12 0.4	+0.76670	+1.31059	-0.01	-8.1552
	22	0.4736	0.590	0.589	310	43.8	20 42.9	179 13.1	11 56.9	0.77247	1.31058	+0.12	+0.0832
	23	0.4764	0.606	0.601	311	17.6	20 45.2	178 20.6	11 53.4	0.77901	1.31056	0.26	0.4091
	24	0.4791	0.620	0.612	311	40.6	20 46.7	177 28.1	11 49.9	0.78566	1.31051	0.39	0.5930
	25	0.4818	0.632	0.623	311	54.4	20 47.6	176 35.6	11 46.4	0.79185	1.31045	0.53	0.7218
	26	0.4845	+0.641	+0.635	312	2.5	20 48.2	175 43.1	11 42.9	+0.79723	+1.31036	+0.66	+0.8208
	27	0.4873	0.649	0.646	312	9.0	20 48.6	174 50.5	11 39.4	0.80145	1.31026	0.80	0.9014
	28	0.4900	0.655	0.657	312	18.0	20 49.2	173 57.9	11 35.9	0.80449	1.31014	0.93	0.9692
	29	0.4928	0.662	0.669	312	33.1	20 50.2	173 5.3	11 32.4	0.80663	1.31000	1.07	0.0277
	30	0.4955	0.669	0.680	312	56.9	20 51.8	172 12.7	11 28.8	0.80830	1.30984	1.20	0.0792
July	1	0.4982	+0.679	+0.691	313	30.0	20 54.0	171 20.0	11 25.3	+0.81006	+1.30966	+1.33	+0.1250
	2	0.5010	+0.691	+0.702	314	10.3	20 56.7	170 27.3	11 21.8	+0.81241	+1.30947	+1.47	+0.1664

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f$		$f'$		$G$		$H$		Log $\kappa$ .	Log $h$ .	$i$	Log $i$ .	
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.							
		y	s	s	°	h	m	°	h	m					
July	1	0.4982	+0.679	+0.691	313	30.0	20 54.0	171	20.0	11 25.3	+0.81006	+1.30966	+1.33	+0.1250	
	2	0.5010	0.691	0.702	314	10.3	20 56.7	170	27.3	11 21.8	0.81241	1.30947	1.47	0.1664	
	3	0.5037	0.706	0.714	314	54.3	20 59.6	169	34.5	11 18.3	0.81577	1.30926	1.60	0.2041	
	4	0.5065	0.722	0.725	315	37.6	21 2.5	168	41.6	11 14.8	0.82031	1.30902	1.73	0.2387	
	h	5	0.5092	0.739	0.736	316	15.9	21 5.1	167	48.7	11 11.2	0.82596	1.30878	1.87	0.2706
	(19.0)	6	0.5119	+0.756	+0.747	316	45.8	21 7.1	166	55.7	11 7.7	+0.83228	+1.30851	+2.00	+0.3002
	7	0.5147	0.772	0.758	317	5.5	21 8.4	166	2.7	11 4.2	0.83889	1.30822	2.13	0.3278	
	8	0.5174	0.786	0.769	317	15.3	21 9.0	165	9.6	11 0.6	0.84514	1.30792	2.26	0.3537	
	9	0.5202	0.796	0.780	317	17.5	21 9.2	164	16.4	10 57.1	0.85063	1.30761	2.39	0.3780	
	10	0.5229	0.804	0.791	317	15.7	21 9.1	163	23.1	10 53.5	0.85502	1.30727	2.52	0.4008	
h	11	0.5256	+0.810	+0.802	317	13.7	21 8.9	162	29.8	10 49.9	+0.85836	+1.30692	+2.65	+0.4225	
	12	0.5284	0.814	0.813	317	15.2	21 9.0	161	36.3	10 46.4	0.86065	1.30656	2.77	0.4429	
	13	0.5311	0.819	0.824	317	23.1	21 9.5	160	42.8	10 42.9	0.86220	1.30618	2.90	0.4624	
	14	0.5338	0.825	0.834	317	38.7	21 10.6	159	49.2	10 39.3	0.86350	1.30578	3.03	0.4809	
	15	0.5366	0.833	0.845	318	1.6	21 12.1	158	55.5	10 35.7	0.86502	1.30537	3.15	0.4985	
	16	0.5393	+0.843	+0.856	318	29.8	21 14.0	158	1.6	10 32.1	+0.86725	+1.30494	+3.28	+0.5153	
	17	0.5421	0.856	0.866	319	0.0	21 16.0	157	7.7	10 28.5	0.87048	1.30450	3.40	0.5314	
	18	0.5448	0.871	0.877	319	28.3	21 17.9	156	13.6	10 24.9	0.87475	1.30405	3.52	0.5468	
	19	0.5475	0.886	0.887	319	51.3	21 19.4	155	19.4	10 21.3	0.87989	1.30358	3.64	0.5615	
	h	20	0.5503	0.901	0.897	320	6.7	21 20.4	154	25.1	10 17.7	0.88556	1.30310	3.76	0.5757
(20.0)	21	0.5530	+0.915	+0.908	320	13.9	21 20.9	153	30.7	10 14.0	+0.89126	+1.30261	+3.88	+0.5893	
h	22	0.5557	0.926	0.918	320	14.0	21 20.9	152	36.1	10 10.4	0.89663	1.30210	4.00	0.6023	
	23	0.5585	0.935	0.928	320	9.6	21 20.6	151	41.4	10 6.8	0.90128	1.30159	4.12	0.6149	
	24	0.5612	0.942	0.938	320	4.1	21 20.3	150	46.6	10 3.1	0.90501	1.30106	4.24	0.6270	
	25	0.5640	0.947	0.948	320	0.6	21 20.0	149	51.5	9 59.4	0.90782	1.30052	4.35	0.6386	
	26	0.5667	+0.952	+0.958	320	1.9	21 20.1	148	56.4	9 55.8	+0.90988	+1.29998	+4.47	+0.6499	
	27	0.5694	0.958	0.968	320	10.2	21 20.7	148	1.1	9 52.1	0.91157	1.29942	4.58	0.6607	
	28	0.5722	0.965	0.978	320	26.1	21 21.7	147	5.6	9 48.4	0.91321	1.29885	4.69	0.6712	
	29	0.5749	0.975	0.987	320	48.1	21 23.2	146	10.0	9 44.7	0.91535	1.29828	4.80	0.6813	
	30	0.5776	0.987	0.997	321	13.6	21 24.9	145	14.2	9 40.9	0.91807	1.29770	4.91	0.6910	
	31	0.5804	+1.002	+1.006	321	39.2	21 26.6	144	18.2	9 37.2	+0.92173	+1.29711	+5.02	+0.7004	
Aug.	1	0.5831	1.017	1.016	322	1.4	21 28.1	143	22.2	9 33.5	0.92614	1.29652	5.12	0.7095	
	2	0.5859	1.033	1.025	322	17.4	21 29.2	142	25.8	9 29.7	0.93122	1.29590	5.23	0.7184	
	3	0.5886	1.047	1.035	322	25.8	21 29.7	141	29.3	9 26.0	0.93644	1.29530	5.33	0.7269	
	h	4	0.5913	1.060	1.044	322	26.7	21 29.8	140	32.6	9 22.2	0.94146	1.29468	5.43	0.7351
	(21.0)	5	0.5941	+1.069	+1.053	322	21.5	21 29.4	139	35.8	9 18.4	+0.94590	+1.29406	+5.53	+0.7430
	6	0.5968	1.076	1.062	322	12.7	21 28.8	138	38.8	9 14.6	0.94948	1.29345	5.63	0.7508	
	7	0.5996	1.080	1.071	322	3.6	21 28.2	137	41.6	9 10.8	0.95211	1.29282	5.73	0.7582	
	8	0.6023	1.083	1.080	321	57.3	21 27.8	136	44.2	9 6.9	0.95390	1.29220	5.83	0.7654	
	9	0.6050	1.086	1.088	321	56.0	21 27.7	135	46.6	9 3.1	0.95504	1.29157	5.92	0.7724	
	10	0.6078	+1.089	+1.097	322	0.8	21 28.0	134	48.8	8 59.3	+0.95588	+1.29093	+6.01	+0.7791	
h	11	0.6105	1.094	1.106	322	11.8	21 28.8	133	51.0	8 55.4	0.95683	1.29031	6.10	0.7856	
	12	0.6132	1.102	1.114	322	27.9	21 29.9	132	52.9	8 51.5	0.95826	1.28969	6.19	0.7920	
	13	0.6160	1.112	1.123	322	46.4	21 31.1	131	54.6	8 47.6	0.96035	1.28906	6.28	0.7980	
	14	0.6187	1.124	1.131	323	4.1	21 32.3	130	56.1	8 43.7	0.96336	1.28844	6.37	0.8040	
	15	0.6215	+1.137	+1.139	323	18.1	21 33.2	129	57.4	8 39.8	+0.96703	+1.28782	+6.45	+0.8096	
	16	0.6242	+1.150	+1.147	323	26.5	21 33.8	128	58.6	8 35.9	+0.97119	+1.28720	+6.53	+0.8152	

## INDEPENDENT STAR-NUMBERS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f$	$f'$	$G$		$H$		$\log g.$	$\log h.$	$i$	$\log i.$	
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
		y	s	s	°	h m	°	h m			"		
Aug.	16	0.6242	+1.150	+1.147	323 26.5	21 33.8	128 58.6	8 35.9	+0.97119	+1.28720	+6.53	+0.8152	
	17	0.6269	1.162	1.155	323 28.4	21 33.9	127 59.6	8 32.0	0.97549	1.28659	6.61	0.8205	
	18	0.6297	1.172	1.163	323 24.5	21 33.6	127 0.3	8 28.0	0.97953	1.28598	6.69	0.8256	
	19	0.6324	1.179	1.171	323 16.6	21 33.1	126 0.9	8 24.1	0.98304	1.28538	6.77	0.8306	
	h	20	0.6351	1.184	1.179	323 7.2	21 32.5	125 1.3	8 20.1	0.98582	1.28478	6.84	0.8353
	(22.0)	21	0.6379	+1.188	+1.187	322 59.1	21 31.9	124 1.5	+0.98784	+1.28419	+6.92	+0.8399	
	22	0.6406	1.190	1.195	322 55.0	21 31.7	123 1.6	8 12.1	0.98920	1.28361	6.99	0.8444	
	23	0.6434	1.194	1.202	322 56.7	21 31.8	122 1.4	8 8.1	0.99015	1.28304	7.06	0.8487	
	24	0.6461	1.198	1.210	323 4.7	21 32.3	121 1.1	8 4.1	0.99101	1.28248	7.13	0.8528	
	25	0.6488	1.205	1.217	323 18.4	21 33.2	120 0.6	8 0.0	0.99210	1.28192	7.19	0.8567	
	26	0.6516	+1.214	+1.225	323 36.0	21 34.4	118 59.9	7 56.0	+0.99375	+1.28138	+7.25	+0.8605	
	27	0.6543	1.225	1.232	323 54.8	21 35.6	117 59.0	7 51.9	0.99611	1.28085	7.31	0.8642	
	28	0.6571	1.238	1.239	324 11.6	21 36.8	116 57.9	7 47.9	0.99919	1.28033	7.37	0.8677	
	29	0.6598	1.252	1.247	324 24.0	21 37.6	115 56.6	7 43.8	1.00279	1.27983	7.43	0.8710	
	30	0.6625	1.265	1.254	324 30.5	21 38.0	114 55.2	7 39.7	1.00662	1.27934	7.49	0.8742	
	31	0.6653	+1.276	+1.261	324 30.8	21 38.1	113 53.6	7 35.6	+1.01040	+1.27886	+7.54	+0.8773	
	Sept.	1	0.6680	1.284	1.268	324 25.7	21 37.7	112 51.8	7 31.5	1.01375	1.27840	7.59	0.8802
		2	0.6707	1.290	1.275	324 17.1	21 37.1	111 49.9	7 27.3	1.01642	1.27796	7.64	0.8829
		3	0.6735	1.293	1.282	324 7.7	21 36.5	110 47.8	7 23.2	1.01830	1.27752	7.68	0.8856
		h	4	0.6762	1.294	1.289	324 0.1	21 36.0	109 45.6	1.01941	1.27711	7.73	0.8881
		(23.0)	5	0.6790	+1.295	+1.296	323 56.6	21 35.8	108 43.2	+1.01991	+1.27672	+7.77	+0.8904
		6	0.6817	1.296	1.302	323 58.5	21 35.9	107 40.7	7 10.7	1.02006	1.27634	7.81	0.8926
		7	0.6844	1.299	1.309	324 6.3	21 36.4	106 38.1	7 6.6	1.02023	1.27598	7.85	0.8947
		8	0.6872	1.304	1.316	324 18.9	21 37.3	105 35.3	7 2.4	1.02072	1.27564	7.88	0.8967
		9	0.6899	1.311	1.322	324 34.3	21 38.3	104 32.4	6 58.2	1.02177	1.27532	7.92	0.8985
		10	0.6926	+1.321	+1.329	324 50.0	21 39.3	103 29.4	6 54.0	+1.02357	+1.27502	+7.95	+0.9002
	11	0.6954	1.332	1.336	325 3.4	21 40.2	102 26.2	6 49.7	1.02600	1.27475	7.98	0.9017	
	12	0.6981	1.343	1.342	325 12.5	21 40.8	101 23.0	6 45.5	1.02804	1.27449	8.00	0.9032	
	13	0.7008	1.354	1.348	325 16.0	21 41.1	100 19.7	6 41.3	1.03205	1.27425	8.02	0.9045	
	14	0.7036	1.363	1.355	325 14.4	21 41.0	99 16.2	6 37.1	1.03506	1.27404	8.05	0.9056	
	15	0.7064	+1.370	+1.361	325 8.9	21 40.6	98 12.7	6 32.9	+1.03770	+1.27385	+8.07	+0.9067	
16	0.7091	1.374	1.368	325 1.7	21 40.1	97 9.1	6 28.6	1.03973	1.27368	8.08	0.9076		
17	0.7118	1.376	1.374	324 55.0	21 39.7	96 5.4	6 24.4	1.04109	1.27353	8.10	0.9084		
18	0.7145	1.378	1.380	324 51.4	21 39.4	95 1.7	6 20.1	1.04183	1.27341	8.11	0.9090		
h	19	0.7173	1.379	1.387	324 52.8	21 39.5	93 57.8	6 15.9	1.04218	1.27331	8.12	0.9096	
(0.0)	20	0.7200	+1.382	+1.393	325 0.0	21 40.0	92 54.0	6 11.6	+1.04238	+1.27323	+8.13	+0.9100	
21	0.7228	1.387	1.400	325 12.8	21 40.9	91 50.0	6 7.3	1.04273	1.27318	8.13	0.9103		
22	0.7255	1.394	1.406	325 29.7	21 42.0	90 46.0	6 3.1	1.04351	1.27315	8.14	0.9104		
23	0.7282	1.404	1.412	325 48.5	21 43.2	89 42.0	5 58.8	1.04494	1.27315	8.14	0.9104		
24	0.7310	1.415	1.419	326 6.5	21 44.4	88 37.9	5 54.5	1.04702	1.27317	8.14	0.9103		
25	0.7337	+1.428	+1.425	326 21.3	21 45.4	87 33.8	5 50.3	+1.04966	+1.27321	+8.13	+0.9101		
26	0.7364	1.441	1.432	326 31.2	21 46.1	86 29.6	5 46.0	1.05261	1.27328	8.12	0.9098		
27	0.7392	1.452	1.438	326 35.3	21 46.4	85 25.5	5 41.7	1.05559	1.27337	8.11	0.9093		
28	0.7419	1.461	1.444	326 34.7	21 46.3	84 21.3	5 37.4	1.05826	1.27348	8.10	0.9087		
29	0.7447	1.467	1.451	326 30.4	21 46.0	83 17.1	5 33.1	1.06039	1.27362	8.09	0.9079		
30	0.7474	+1.470	+1.457	326 25.0	21 45.7	82 12.9	5 28.9	+1.06185	+1.27378	+8.07	+0.9071		
Oct.	1	0.7501	+1.471	+1.464	326 20.7	21 45.4	81 8.8	5 24.6	+1.06262	+1.27396	+8.05	+0.9061	

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f$	$f'$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .	
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.					
		y	s	s	°	h m	°	h m			"		
Oct.	1	0.7501	+1.471	+1.464	326 20.7	21 45.4	81 8.8	5 24.6	+1.06262	+1.27396	+8.05	+0.9061	
	2	0.7529	1.472	1.470	326 19.8	21 45.3	80 4.6	5 20.3	1.06279	1.27417	8.03	0.9049	
	3	0.7556	1.472	1.476	326 23.7	21 45.6	79 0.5	5 16.0	1.06261	1.27440	8.01	0.9037	
	4	0.7584	1.474	1.483	326 33.1	21 46.2	77 56.5	5 11.8	1.06234	1.27465	7.98	0.9023	
	h	5	0.7611	1.478	1.490	326 47.2	21 47.1	76 52.4	5 7.5	1.06237	1.27493	7.96	0.9007
	(1.0)	6	0.7638	+1.485	+1.496	327 4.6	21 48.3	75 48.4	5 3.2	+1.06288	+1.27522	+7.93	+0.8991
	7	0.7666	1.494	1.503	327 22.9	21 49.5	74 44.5	4 59.0	1.06402	1.27554	7.89	0.8973	
	8	0.7693	1.504	1.510	327 39.6	21 50.6	73 40.6	4 54.7	1.06581	1.27588	7.86	0.8953	
	9	0.7720	1.516	1.516	327 52.8	21 51.5	72 36.8	4 50.5	1.06811	1.27624	7.82	0.8932	
	10	0.7748	1.527	1.523	328 1.1	21 52.1	71 33.1	4 46.2	1.07069	1.27662	7.78	0.8910	
	11	0.7775	+1.538	+1.530	328 4.7	21 52.3	70 29.5	4 42.0	+1.07325	+1.27702	+7.74	+0.8886	
	12	0.7802	1.545	1.537	328 4.1	21 52.3	69 26.0	4 37.7	1.07553	1.27743	7.69	0.8861	
	13	0.7830	1.551	1.544	328 1.6	21 52.1	68 22.5	4 33.5	1.07729	1.27787	7.65	0.8835	
	14	0.7857	1.555	1.551	327 59.1	21 51.9	67 19.1	4 29.3	1.07849	1.27832	7.60	0.8807	
	15	0.7885	1.557	1.558	327 59.0	21 51.9	66 15.9	4 25.1	1.07912	1.27879	7.55	0.8777	
h	16	0.7912	+1.559	+1.565	328 3.3	21 52.2	65 12.8	4 20.9	+1.07937	+1.27928	+7.49	+0.8746	
	17	0.7939	1.562	1.572	328 12.9	21 52.9	64 9.7	4 16.6	1.07945	1.27978	7.44	0.8713	
	18	0.7967	1.567	1.580	328 27.9	21 53.9	63 6.8	4 12.5	1.07967	1.28030	7.38	0.8679	
	19	0.7994	1.574	1.587	328 47.0	21 55.1	62 4.0	4 8.3	1.08026	1.28083	7.32	0.8643	
	h	20	0.8022	1.584	1.595	329 8.3	21 56.6	61 1.3	4 4.1	1.08143	1.28137	7.25	0.8606
	(2.0)	21	0.8049	+1.597	+1.602	329 29.4	21 58.0	59 58.7	3 59.9	+1.08323	+1.28193	+7.19	+0.8567
	22	0.8076	1.611	1.610	329 47.9	21 59.2	58 56.3	3 55.8	1.08560	1.28250	7.12	0.8526	
	23	0.8104	1.625	1.618	330 2.2	22 0.1	57 54.0	3 51.6	1.08834	1.28308	7.05	0.8483	
	24	0.8131	1.638	1.625	330 11.1	22 0.7	56 51.8	3 47.5	1.09117	1.28368	6.98	0.8439	
	25	0.8158	1.649	1.633	330 15.2	22 1.0	55 49.7	3 43.3	1.09379	1.28428	6.91	0.8393	
	26	0.8186	+1.658	+1.641	330 15.9	22 1.1	54 47.8	3 39.2	+1.09598	+1.28489	+6.83	+0.8345	
	27	0.8213	1.663	1.649	330 15.0	22 1.0	53 45.9	3 35.1	1.09758	1.28550	6.75	0.8295	
	28	0.8241	1.667	1.657	330 14.7	22 1.0	52 44.3	3 31.0	1.09855	1.28614	6.67	0.8243	
	29	0.8268	1.670	1.666	330 17.3	22 1.2	51 42.8	3 26.9	1.09902	1.28677	6.59	0.8189	
	30	0.8295	1.671	1.674	330 23.9	22 1.6	50 41.5	3 22.8	1.09905	1.28741	6.51	0.8133	
Nov.	31	0.8323	+1.675	+1.682	330 35.6	22 2.4	49 40.3	3 18.7	+1.09903	+1.28805	+6.42	+0.8075	
	1	0.8350	1.680	1.691	330 51.7	22 3.4	48 39.2	3 14.6	1.09922	1.28870	6.33	0.8015	
	2	0.8378	1.688	1.699	331 11.1	22 4.7	47 38.3	3 10.6	1.09988	1.28935	6.24	0.7952	
	3	0.8405	1.698	1.708	331 31.6	22 6.1	46 37.5	3 6.5	1.10112	1.29001	6.15	0.7888	
	h	4	0.8432	1.710	1.717	331 50.9	22 7.4	45 36.9	3 2.5	1.10299	1.29066	6.05	0.7821
	(3.0)	5	0.8460	+1.724	+1.726	332 7.1	22 8.5	44 36.5	2 58.4	+1.10534	+1.29132	+5.96	+0.7751
	6	0.8487	1.738	1.735	332 18.7	22 9.2	43 36.2	2 54.4	1.10801	1.29197	5.86	0.7679	
	7	0.8514	1.751	1.744	332 25.7	22 9.7	42 36.0	2 50.4	1.11072	1.29262	5.76	0.7604	
	8	0.8542	1.761	1.753	332 28.7	22 9.9	41 36.1	2 46.4	1.11321	1.29328	5.66	0.7527	
	9	0.8569	1.770	1.762	332 29.2	22 9.9	40 36.2	2 42.4	1.11529	1.29393	5.56	0.7447	
	10	0.8596	+1.777	+1.772	332 29.3	22 10.0	39 36.6	2 38.4	+1.11686	+1.29458	+5.45	+0.7364	
	11	0.8624	1.782	1.781	332 31.2	22 10.1	38 37.1	2 34.5	1.11795	1.29523	5.34	0.7278	
	12	0.8651	1.786	1.791	332 36.8	22 10.5	37 37.7	2 30.5	1.11865	1.29587	5.23	0.7189	
	13	0.8679	1.791	1.801	332 47.0	22 11.1	36 38.5	2 26.6	1.11920	1.29650	5.12	0.7096	
	14	0.8706	1.798	1.810	333 1.9	22 12.1	35 39.4	2 22.6	1.11985	1.29713	5.01	0.7000	
15	0.8733	+1.807	+1.820	333 20.8	22 13.4	34 40.4	2 18.7	+1.12083	+1.29774	+4.90	+0.6901		
16	0.8761	+1.819	+1.830	333 41.8	22 14.8	33 41.7	2 14.8	+1.12234	+1.29836	+4.78	+0.6798		

(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Apr. 1	-8.73094	-0.6948	-1.26420	-0.61354	May 17	+8.83493	-0.6750	-1.01636	-1.23111
2	8.70096	0.6966	1.26260	0.64846	18	8.84267	0.6751	1.00519	1.23587
3	8.67348	0.6995	1.26087	0.68065	19	8.84991	0.6736	0.99359	1.24046
4	8.65099	0.7028	1.25900	0.71049	20	8.85884	0.6706	0.98156	1.24488
5	8.63508	0.7059	1.25700	0.73827	21	8.87151	0.6664	0.96906	1.24913
h (13.0) 6	-8.62500	-0.7081	-1.25486	-0.76425	h (13.0) 22	+8.88852	-0.6618	-0.95608	-1.25321
7	8.61836	0.7088	1.25258	0.78862	23	8.90950	0.6575	0.94257	1.25714
8	8.61172	0.7079	1.25016	0.81157	24	8.93323	0.6544	0.92851	1.26090
9	8.60097	0.7056	1.24760	0.83323	25	8.95775	0.6528	0.91386	1.26452
10	8.58252	0.7021	1.24490	0.85374	26	8.98114	0.6531	0.89857	1.26798
11	-8.55315	-0.6981	-1.24205	-0.87318	27	+9.00208	-0.6550	-0.88260	-1.27129
12	8.51081	0.6945	1.23906	0.89165	28	9.01961	0.6580	0.86591	1.27446
13	8.45423	0.6917	1.23593	0.90924	29	9.03346	0.6612	0.84842	1.27748
14	8.38328	0.6903	1.23264	0.92602	30	9.04415	0.6640	0.83008	1.28036
15	8.29885	0.6906	1.22921	0.94203	31	9.05242	0.6656	0.81080	1.28309
16	-8.20575	-0.6922	-1.22562	-0.95735	June 1	+9.05971	-0.6657	-0.79051	-1.28569
17	8.11261	0.6948	1.22188	0.97201	2	9.06744	0.6641	0.76910	1.28816
18	8.03019	0.6976	1.21798	0.98606	3	9.07675	0.6611	0.74645	1.29048
19	7.96988	0.7000	1.21392	0.99954	4	9.08853	0.6571	0.72244	1.29268
20	7.93450	0.7012	1.20969	1.01249	5	9.10292	0.6530	0.69690	1.29474
h (14.0) 21	-7.91328	-0.7008	-1.20530	-1.02493	h (17.0) 6	+9.11939	-0.6496	-0.66963	-1.29667
22	7.88818	0.6989	1.20074	1.03689	7	9.13710	0.6475	0.64042	1.29847
23	7.83315	0.6956	1.19601	1.04841	8	9.15470	0.6472	0.60898	1.30015
24	7.71181	0.6914	1.19110	1.05950	9	9.17097	0.6487	0.57497	1.30169
25	-7.41830	0.6869	1.18602	1.07019	10	9.18520	0.6517	0.53794	1.30311
26	+6.86332	-0.6830	-1.18074	-1.08049	11	+9.19673	-0.6555	-0.49733	-1.30440
27	7.67394	0.6802	1.17528	1.09043	12	9.20548	0.6594	0.45241	1.30557
28	7.95569	0.6790	1.16963	1.10001	13	9.21195	0.6626	0.40218	1.30662
29	8.12418	0.6794	1.16378	1.10927	14	9.21672	0.6644	0.34526	1.30754
30	8.23477	0.6812	1.15772	1.11820	15	9.22097	0.6646	0.27960	1.30834
May 1	+8.30963	-0.6838	-1.15145	-1.12683	16	+9.22554	-0.6632	-0.20210	-1.30902
2	8.35889	0.6862	1.14497	1.13517	17	9.23152	0.6605	0.10758	1.30957
3	8.39182	0.6881	1.13827	1.14322	18	9.23935	0.6571	0.98645	1.31001
4	8.41531	0.6886	1.13134	1.15101	19	9.24910	0.6540	0.81775	1.31032
5	8.43569	0.6876	1.12417	1.15853	20	9.26043	0.6517	0.53800	1.31052
h (15.0) 6	+8.45924	-0.6849	-1.11676	-1.16579	h (18.0) 21	+9.27265	-0.6509	-0.851791	-1.31059
7	8.48996	0.6809	1.10910	1.17282	22	9.28490	0.6520	+0.44591	1.31054
8	8.52917	0.6763	1.10117	1.17960	23	9.29634	0.6548	0.77176	1.31037
9	8.57507	0.6717	1.09298	1.18616	24	9.30630	0.6589	0.95574	1.31008
10	8.62428	0.6679	1.08451	1.19249	25	9.31450	0.6636	0.08447	1.30968
11	+8.67274	-0.6655	-1.07575	-1.19861	26	+9.32096	-0.6680	+0.18354	-1.30915
12	8.71700	0.6649	1.06668	1.20452	27	9.32609	0.6715	0.26406	1.30850
13	8.75504	0.6658	1.05731	1.21022	28	9.33035	0.6735	0.33185	1.30772
14	8.78540	0.6680	1.04760	1.21573	29	9.33459	0.6739	0.39038	1.30683
15	8.80821	0.6708	1.03755	1.22104	30	9.33953	0.6728	0.44184	1.30581
16	+8.82413	-0.6734	-1.02715	-1.22617	July 1	+9.34573	-0.6706	+0.48774	-1.30468
17	+8.83493	-0.6750	-1.01636	-1.23111	2	+9.35338	-0.6681	+0.52914	-1.30341

E = - 0".04 = - 0".003

[Eph 10]



# BESSELIAN STAR-NUMBERS, 1910.

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(CONSTANTS OF STRUVE AND PETERS.)

## FOR WASHINGTON MEAN MIDNIGHT.

FOR WASHINGTON MEAN MIDNIGHT.									
Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
July	1 + 9.34573	- 0.6706	+ 0.48774	- 1.30468	Aug. 16	+ 9.57390	- 0.7462	+ 1.17784	- 1.08585
2	9.35338	0.6681	0.52914	1.30341	17	9.57838	0.7501	1.18316	1.07586
3	9.36239	0.6660	0.56683	1.30202	18	9.58206	0.7548	1.18829	1.06550
4	9.37238	0.6650	0.60140	1.30051	19	9.58482	0.7597	1.19325	1.05476
5	9.38269	0.6656	0.63331	1.29887	20	9.58670	0.7641	1.19802	1.04361
<sup>h</sup> (19.0)	6 + 9.39259	- 0.6680	+ 0.66292	- 1.29711	<sup>h</sup> (23.0)	21 + 9.58797	- 0.7674	+ 1.20263	- 1.03204
7	9.40152	0.6719	0.69053	1.29521	22	9.58893	0.7695	1.20707	1.02003
8	9.40892	0.6768	0.71638	1.29319	23	9.59004	0.7702	1.21135	1.00754
9	9.41467	0.6820	0.74065	1.29104	24	9.59166	0.7697	1.21546	0.99454
10	9.41891	0.6867	0.76353	1.28875	25	9.59405	0.7685	1.21941	0.98102
11	+ 9.42195	- 0.6903	+ 0.78515	- 1.28634	26	+ 9.59735	- 0.7671	+ 1.22321	- 0.96692
12	9.42442	0.6924	0.80563	1.28378	27	9.60144	0.7662	1.22686	0.95221
13	9.42689	0.6928	0.82507	1.28109	28	9.60608	0.7664	1.23035	0.93686
14	9.42998	0.6920	0.84357	1.27827	29	9.61080	0.7678	1.23370	0.92080
15	9.43414	0.6903	0.86119	1.27530	30	9.61522	0.7705	1.23690	0.90398
16	+ 9.43955	- 0.6886	+ 0.87801	- 1.27219	31	+ 9.61902	- 0.7742	+ 1.23995	- 0.88636
17	9.44613	0.6874	0.89409	1.26894	Sept. 1	9.62191	0.7785	1.24286	0.86784
18	9.45347	0.6875	0.90948	1.26554	2	9.62380	0.7826	1.24563	0.84836
19	9.46108	0.6893	0.92423	1.26199	3	9.62482	0.7862	1.24826	0.82783
20	9.46838	0.6926	0.93837	1.25829	4	9.62524	0.7886	1.25076	0.80614
<sup>h</sup> (20.0)	21 + 9.47484	- 0.6972	+ 0.95196	- 1.25444	<sup>h</sup> (23.0)	5 + 9.62541	- 0.7897	+ 1.25311	- 0.78316
22	9.48022	0.7026	0.96502	1.25044	6	9.62574	0.7895	1.25533	0.75876
23	9.48441	0.7079	0.97758	1.24627	7	9.62663	0.7884	1.25742	0.73275
24	9.48756	0.7125	0.98968	1.24194	8	9.62826	0.7866	1.25937	0.70495
25	9.49000	0.7158	1.00133	1.23744	9	9.63071	0.7850	1.26119	0.67509
26	+ 9.49220	- 0.7177	+ 1.01257	- 1.23277	10	+ 9.63391	- 0.7840	+ 1.26288	- 0.64288
27	9.49478	0.7181	1.02340	1.22793	11	9.63753	0.7840	1.26443	0.60794
28	9.49807	0.7173	1.03386	1.22290	12	9.64126	0.7853	1.26586	0.56978
29	9.50243	0.7160	1.04396	1.21770	13	9.64468	0.7877	1.26716	0.52778
30	9.50782	0.7148	1.05371	1.21231	14	9.64756	0.7910	1.26833	0.48113
31	+ 9.51407	- 0.7144	+ 1.06313	- 1.20673	15	+ 9.64971	- 0.7947	+ 1.26937	- 0.42868
Aug. 1	9.52064	0.7153	1.07224	1.20096	16	9.65110	0.7980	1.27029	0.36884
2	9.52732	0.7177	1.08104	1.19496	17	9.65187	0.8006	1.27108	0.29923
3	9.53336	0.7216	1.08956	1.18877	18	9.65230	0.8020	1.27174	0.21609
4	9.53847	0.7265	1.09779	1.18236	19	9.65276	0.8021	1.27227	0.11296
<sup>h</sup> (21.0)	5 + 9.54240	- 0.7317	+ 1.10575	- 1.17574	<sup>h</sup> (0.0)	20 + 9.65360	- 0.8010	+ 1.27268	- 0.97718
6	9.54512	0.7368	1.11345	1.16888	21	9.65508	0.7990	1.27296	0.97782
7	9.54687	0.7409	1.12090	1.16179	22	9.65734	0.7967	1.27311	- 0.93962
8	9.54802	0.7437	1.12811	1.15445	23	9.66039	0.7946	1.27314	+ 8.99320
9	9.54903	0.7451	1.13508	1.14687	24	9.66401	0.7934	1.27304	9.65134
10	+ 9.55033	- 0.7451	+ 1.14182	- 1.13902	25	+ 9.66790	- 0.7932	+ 1.27282	+ 9.90188
11	9.55238	0.7443	1.14835	1.13090	26	9.67168	0.7943	1.27246	0.05975
12	9.55538	0.7430	1.15465	1.12250	27	9.67500	0.7964	1.27198	0.17525
13	9.55929	0.7422	1.16075	1.11381	28	9.67762	0.7992	1.27137	0.26634
14	9.56395	0.7422	1.16664	1.10481	29	9.67939	0.8022	1.27063	0.34154
15	+ 9.56894	- 0.7434	+ 1.17234	- 1.09550	30	+ 9.68040	0.8047	+ 1.26976	+ 0.40554
16	9.57390	- 0.7462	+ 1.17784	- 1.08585	Oct. 1	+ 9.68081	- 0.8063	+ 1.26876	+ 0.46123

E = - 0<sup>h</sup>.03 = - 0<sup>s</sup>.002

E = - 0".03 = - 0s.002

[Eph 10]

MEAN PLACES FOR 1910.0. (January 0<sup>d</sup>.521, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
33 Piscium . . . . .	4.7	0	0	43.755	+ 3.0715	- 6	12	39.72	+ 20.137
<i>α</i> Andromedæ . . . . .	2.1	0	3	43.972	3.0952	+ 28	35	36.83	19.881
<i>β</i> Cassiopeia . . . . .	2.4	0	4	22.138	3.1823	+ 58	39	12.25	19.862
22 Andromedæ . . . . .	4.9	0	5	38.354	3.1081	+ 45	34	17.20	20.035
<i>γ</i> Pegasi ( <i>Algenib</i> ) . . . . .	2.8	0	8	35.989	3.0859	+ 14	40	59.70	20.022
<i>σ</i> Andromedæ . . . . .	4.4	0	13	37.360	+ 3.1264	+ 36	17	10.60	+ 19.964
<i>ι</i> Ceti . . . . .	3.6	0	14	50.560	3.0570	- 9	19	21.99	19.974
44 Piscium . . . . .	5.8	0	20	47.316	3.0742	+ 1	26	28.62	19.940
<i>β</i> Hydri . . . . .	2.8	0	21	2.208	3.2073	- 77	45	40.04	20.280
12 Ceti . . . . .	6.0	0	25	26.761	3.0621	- 4	27	16.09	19.922
<i>π</i> Andromedæ . . . . .	4.4	0	32	4.238	+ 3.1965	+ 33	13	26.52	+ 19.851
<i>α</i> Cassiopeia ( <i>var.</i> ) . . . . .	2.3	0	35	23.570	3.3841	+ 56	2	38.00	19.776
<i>β</i> Ceti . . . . .	2.2	0	39	4.356	3.0127	- 18	28	49.41	19.797
21 Cassiopeia . . . . .	5.7	0	39	41.185	3.8976	+ 74	29	46.63	19.720
<i>ν</i> Cassiopeia . . . . .	4.7	0	39	42.301	3.3293	+ 47	47	31.13	19.740
<i>δ</i> Piscium . . . . .	4.8	0	44	0.701	+ 3.1097	+ 7	5	43.57	+ 19.633
<i>γ</i> Cassiopeia . . . . .	2.3	0	51	16.053	3.5943	+ 60	13	46.48	19.541
<i>μ</i> Andromedæ . . . . .	4.0	0	51	45.215	3.3196	+ 38	0	40.86	19.567
43 Cephei (H.) . . . . .	4.6	0	56	16.129	7.5417	+ 85	46	29.28	19.441
<i>ε</i> Piscium . . . . .	4.3	0	58	16.253	3.1108	+ 7	24	20.78	19.427
<i>β</i> Andromedæ . . . . .	2.2	1	4	41.310	+ 3.3493	+ 35	8	36.94	+ 19.136
<i>κ</i> Tucanæ . . . . .	4.9	1	12	43.031	2.0405	- 69	21	15.18	19.134
<i>f</i> Piscium . . . . .	5.1	1	13	9.341	3.0922	+ 3	8	26.63	19.008
<i>θ</i> Ceti . . . . .	3.6	1	19	31.460	2.9977	- 8	38	51.10	18.637
38 Cassiopeia . . . . .	5.9	1	24	30.921	4.4082	+ 69	48	6.61	18.626
<i>η</i> Piscium . . . . .	3.7	1	26	39.896	+ 3.2051	+ 14	52	55.72	+ 18.627
<i>α</i> Ursæ Minoris ( <i>Polaris</i> ) . . . . .	2.2	1	26	55.88*	27.3618	+ 88	49	33.56	18.624
<i>υ</i> Andromedæ . . . . .	4.2	1	31	30.581	3.5081	+ 40	57	20.28	18.092
<i>π</i> Piscium . . . . .	5.5	1	32	19.516	3.1759	+ 11	40	53.06	18.476
<i>α</i> Eridani ( <i>Achernar</i> ) . . . . .	0.4	1	34	21.796	2.2370	- 57	41	37.94	18.330
<i>ν</i> Piscium . . . . .	4.6	1	36	44.780	+ 3.1193	+ 5	1	56.97	+ 18.290
<i>υ</i> Piscium . . . . .	4.4	1	40	38.363	3.1644	+ 8	42	18.18	18.189
<i>ζ</i> Ceti . . . . .	3.6	1	47	1.063	2.9600	- 10	46	45.49	17.873
<i>β</i> Arietis . . . . .	2.8	1	49	39.901	3.3074	+ 20	22	6.31	17.684
50 Cassiopeia . . . . .	4.1	1	55	43.619	5.0515	+ 71	59	10.64	17.564
<i>γ</i> Andromedæ . . . . .	2.2	1	58	22.169	+ 3.6693	+ 41	53	53.86	+ 17.381
<i>α</i> Arietis . . . . .	2.1	2	2	5.798	3.3751	+ 23	2	14.19	17.124
<i>β</i> Trianguli . . . . .	3.1	2	4	11.038	3.5600	+ 34	33	43.14	17.130
<i>ε</i> Ceti . . . . .	4.5	2	8	13.673	3.1763	+ 8	25	29.34	16.973
<i>γ</i> Trianguli . . . . .	4.3	2	11	57.585	3.5569	+ 33	25	52.96	16.762
67 Ceti . . . . .	5.6	2	12	29.599	+ 2.9904	- 6	50	11.72	+ 16.678
<i>δ</i> Hydri . . . . .	4.2	2	20	8.612	1.0569	- 69	4	7.49	16.433
<i>ι</i> Cassiopeia . . . . .	4.6	2	21	38.203	4.8963	+ 66	59	54.16	16.348
<i>ε</i> Ceti . . . . .	4.5	2	23	22.314	+ 3.1858	+ 8	3	25.56	16.243
<i>μ</i> Hydri . . . . .	5.3	2	33	33.203	- 1.3634	- 79	30	7.86	15.675
<i>δ</i> Ceti . . . . .	4.1	2	34	52.096	+ 3.0727	- 0	3	33.20	+ 15.645
<i>θ</i> Persei . . . . .	4.2	2	38	2.783	4.0807	+ 48	50	54.21	15.378
<i>γ</i> Ceti . . . . .	3.6	2	38	38.136	+ 3.1055	+ 2	51	25.06	+ 15.282

MEAN PLACES FOR 1910.0. (January 0<sup>d</sup>.521, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
$\alpha$ Arietis . . . . .	5.5	2	46	31.273	+ 3.3073	+ 14	42	41.74	+ 14.949
$\epsilon$ Arietis . . . . .	4.6	2	54	3.760	3.4245	+ 20	58	51.07	14.527
47 Cephei (H.) . . . . .	5.7	2	54	4.720	7.8251	+ 79	3	50.89	14.546
$\alpha$ Ceti . . . . .	2.6	2	57	34.391	3.1327	+ 3	44	13.66	14.246
$\beta$ Persei ( <i>Algol</i> ) ( <i>var.</i> ) . . . . .	2.3	3	2	18.474	3.8916	+ 40	36	34.32	14.029
48 Cephei (H.) . . . . .	5.5	3	8	51.895	+ 7.4827	+ 77	24	18.69	+ 13.561
$\zeta$ Arietis . . . . .	4.8	3	9	43.527	3.4428	+ 20	42	41.00	13.479
$\alpha$ Persei . . . . .	1.9	3	17	53.457	+ 4.2666	+ 49	32	29.58	12.998
$\iota$ Hydri . . . . .	5.7	3	18	10.930	- 1.5631	- 77	43	3.04	13.047
$f$ Tauri . . . . .	4.3	3	25	54.142	+ 3.3084	+ 12	37	43.79	12.488
$\epsilon$ Eridani . . . . .	3.7	3	28	41.366	+ 2.8249	- 9	45	44.37	+ 12.320
$\delta$ Persei . . . . .	3.1	3	36	30.689	4.2579	+ 47	30	1.83	11.710
$\gamma$ Camelopardalis . . . . .	4.6	3	40	50.490	6.2760	+ 71	3	21.06	11.381
$\eta$ Tauri . . . . .	3.1	3	42	7.913	3.5607	+ 23	49	38.76	11.295
$\zeta$ Persei . . . . .	3.0	3	48	28.280	+ 3.7645	+ 31	37	1.26	10.869
$\gamma$ Hydri . . . . .	3.3	3	48	37.282	- 0.9706	- 74	30	53.89	+ 10.989
$\epsilon$ Persei . . . . .	3.0	3	51	48.654	+ 4.0178	+ 39	45	2.08	10.610
$\gamma$ Eridani . . . . .	3.0	3	53	49.801	2.7982	- 13	45	50.47	10.376
A <sup>1</sup> Tauri . . . . .	4.6	3	59	22.337	3.5425	+ 21	50	11.98	10.012
$c$ Persei . . . . .	4.3	4	2	7.419	4.3453	+ 47	28	22.72	9.830
$\alpha^1$ Eridani . . . . .	4.2	4	7	28.298	+ 2.9270	- 7	4	17.92	+ 9.538
$\gamma$ Tauri . . . . .	3.8	4	14	40.197	3.4110	+ 15	24	39.37	8.866
$\epsilon$ Tauri . . . . .	3.6	4	23	21.582	+ 3.5001	+ 18	58	53.35	8.170
$\delta$ Mensæ . . . . .	5.6	4	24	2.044	- 4.1615	- 80	25	31.50	8.223
$m$ Persei . . . . .	6.0	4	27	4.753	+ 4.2138	+ 42	52	20.76	7.911
$\alpha$ Tauri ( <i>Aldebaran</i> ) . . . . .	1.0	4	30	45.279	+ 3.4395	+ 16	19	44.47	+ 7.421
$\tau$ Tauri . . . . .	4.5	4	36	50.503	3.5980	+ 22	47	5.79	7.096
$\alpha$ Camelopardalis . . . . .	4.4	4	45	5.807	5.9448	+ 66	11	27.39	6.441
$i$ Tauri . . . . .	5.2	4	46	6.458	3.5071	+ 18	41	14.51	6.317
$\iota$ Aurigæ . . . . .	2.8	4	51	7.830	3.9031	+ 33	1	27.65	5.912
$\zeta$ Aurigæ . . . . .	3.9	4	56	11.077	+ 4.1887	+ 40	56	43.17	+ 5.488
11 Orionis . . . . .	4.7	4	59	25.518	3.4262	+ 15	16	46.01	5.201
$\beta$ Eridani . . . . .	2.9	5	3	25.503	2.9490	- 5	12	7.69	4.824
$\alpha$ Aurigæ ( <i>Capella</i> ) . . . . .	0.1	5	10	2.307	4.4279	+ 45	54	26.47	3.907
$\beta$ Orionis ( <i>Rigel</i> ) . . . . .	0.3	5	10	12.716	2.8821	- 8	18	17.99	4.321
$\tau$ Orionis . . . . .	3.8	5	13	14.164	+ 2.9123	- 6	56	27.77	+ 4.057
$\beta$ Tauri . . . . .	1.8	5	20	36.097	3.7909	+ 28	31	55.89	3.252
$\chi$ Aurigæ . . . . .	5.0	5	26	52.144	3.9036	+ 32	7	34.34	2.875
$\delta$ Orionis ( <i>var.</i> ) . . . . .	2.3	5	27	24.488	3.0641	- 0	21	54.45	2.839
Groombridge 966 . . . . .	6.4	5	27	41.010	8.0054	+ 74	59	8.87	2.834
$\alpha$ Leporis . . . . .	2.7	5	28	45.637	+ 2.6455	- 17	53	10.22	+ 2.724
$\epsilon$ Orionis . . . . .	1.8	5	31	38.771	3.0434	- 1	15	31.42	2.475
Groombridge 944 . . . . .	6.4	5	33	1.497	18.7396	+ 85	9	14.46	2.350
$\alpha$ Columbæ . . . . .	2.7	5	36	23.402	2.1723	- 34	7	18.08	2.023
$\kappa$ Orionis . . . . .	2.3	5	43	29.272	2.8447	- 9	42	3.64	1.440
$\delta$ Doradus . . . . .	4.4	5	44	36.598	+ 0.1017	- 65	46	9.41	+ 1.344
$\nu$ Aurigæ . . . . .	4.1	5	45	15.098	4.1571	+ 39	7	22.72	1.302
$\alpha$ Orionis ( <i>var.</i> ) . . . . .	0.9	5	50	17.948	+ 3.2477	+ 7	23	27.43	+ 0.858

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Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
β Aurigæ . . . . .	2.0	5	52	55.652	+ 4.4016	+ 44	56	21.09	+ 0.612
θ Aurigæ . . . . .	2.9	5	53	35.044	4.0915	+ 37	12	25.41	+ 0.470
ν Orionis . . . . .	4.5	6	2	26.026	3.4263	+ 14	46	47.58	- 0.238
22 Camelopardalis (H.) . . . . .	4.7	6	8	55.895	6.6190	+ 69	21	9.96	0.895
γ Geminorum . . . . .	3.5	6	9	26.740	3.6227	+ 22	32	0.94	0.842
μ Geminorum . . . . .	3.2	6	17	30.971	+ 3.6308	+ 22	33	37.94	- 1.645
φ <sup>1</sup> Aurigæ . . . . .	5.1	6	17	58.156	4.6262	+ 49	20	5.20	1.574
α Argûs ( <i>Canopus</i> ) . . . . .	-0.8	6	21	57.242	1.3319	- 52	38	46.64	1.908
ν Geminorum . . . . .	4.2	6	23	37.164	3.5630	+ 20	16	11.43	2.078
γ Geminorum . . . . .	2.0	6	32	30.794	3.4671	+ 16	28	36.37	2.882
ε Geminorum . . . . .	3.2	6	38	23.739	+ 3.6930	+ 25	13	15.61	- 3.361
φ <sup>5</sup> Aurigæ . . . . .	5.4	6	40	15.311	4.3303	+ 43	40	4.25	3.343
† α Canis Majoris ( <i>Sirius</i> ) . . . . .	-1.4	6	41	10.929	2.6435	- 16	35	31.77	4.790
θ Geminorum . . . . .	3.7	6	46	51.537	+ 3.9586	+ 34	4	14.00	4.120
ζ Mensæ . . . . .	5.6	6	47	33.122	- 4.9342	- 80	43	10.00	4.047
ε Canis Majoris . . . . .	1.5	6	55	5.315	+ 2.3574	- 28	50	56.63	- 4.769
51 Cephei (H.) . . . . .	5.3	6	58	39.12*	29.3753	+ 87	11	31.51	5.110
ζ Geminorum ( <i>var.</i> ) . . . . .	4.0	6	58	46.323	3.5609	+ 20	42	10.81	5.092
δ Canis Majoris . . . . .	1.9	7	4	43.864	2.4381	- 26	14	59.21	5.583
63 Aurigæ . . . . .	5.2	7	5	28.059	+ 4.1336	+ 39	28	5.39	5.651
γ <sup>2</sup> Volantis ( <i>var.</i> ) . . . . .	3.9	7	9	30.785	- 0.4996	- 70	21	10.34	- 5.910
25 Camelopardalis (H.) . . . . .	5.3	7	12	12.460	+ 12.8522	+ 82	35	14.37	6.258
δ Geminorum . . . . .	3.5	7	14	44.979	3.5869	+ 22	8	55.53	6.437
Piazzî vii, 67 . . . . .	5.7	7	21	31.578	6.2793	+ 68	39	2.28	7.026
β Canis Minoris . . . . .	3.1	7	22	16.261	3.2557	+ 8	28	16.66	7.089
α <sup>2</sup> Geminorum ( <i>Castor</i> ) . . . . .	1.9	7	28	51.568	+ 3.8339	+ 32	5	12.82	- 7.661
† α Canis Min. ( <i>Procyon</i> ) . . . . .	0.5	7	34	35.480	3.1424	+ 5	27	22.01	9.078
β Geminorum ( <i>Pollux</i> ) . . . . .	1.2	7	39	48.637	3.6764	+ 28	14	39.33	8.512
φ Geminorum . . . . .	5.0	7	47	59.497	3.6773	+ 26	59	58.15	9.127
26 Lyncis . . . . .	5.8	7	48	9.860	4.3830	+ 47	47	55.35	9.119
Groombridge 1374 . . . . .	5.6	7	49	26.562	+ 7.2534	+ 74	9	34.47	- 9.250
ω <sup>1</sup> Cancri . . . . .	6.0	7	55	29.236	3.6346	+ 25	38	23.34	9.683
15 Argûs (ρ) . . . . .	3.1	8	3	42.654	2.5546	- 24	2	39.36	10.251
3 Ursæ Majoris (H.) . . . . .	5.5	8	3	52.146	6.0180	+ 68	44	24.22	10.310
ζ <sup>1</sup> Cancri . . . . .	4.8	8	7	3.129	3.4450	+ 17	55	11.61	10.681
β Cancri . . . . .	3.8	8	11	38.125	+ 3.2560	+ 9	27	48.63	- 10.943
30 Monocerotis . . . . .	3.9	8	21	9.870	+ 2.9998	- 3	36	44.13	11.601
θ Chamæleontis . . . . .	4.6	8	23	21.334	- 1.7389	- 77	11	40.23	11.720
γ Cancri . . . . .	5.4	8	27	30.387	+ 3.4750	+ 20	44	50.81	12.085
σ Hydræ . . . . .	4.5	8	34	3.275	3.1386	+ 3	39	28.75	12.495
γ Cancri . . . . .	4.9	8	38	4.815	+ 3.4776	+ 21	47	33.86	- 12.799
ε Hydræ . . . . .	3.5	8	42	0.682	3.1801	+ 6	44	58.51	13.068
σ <sup>2</sup> Cancri ( <i>mean</i> ) . . . . .	5.5	8	48	45.412	3.6690	+ 30	55	14.99	13.484
ι Ursæ Majoris . . . . .	3.3	8	53	3.095	4.1249	+ 48	23	44.25	13.987
σ <sup>2</sup> Ursæ Majoris . . . . .	5.0	9	2	29.373	5.3288	+ 67	30	2.42	14.394
κ Cancri . . . . .	5.1	9	2	52.454	+ 3.2532	+ 11	1	51.11	- 14.364
θ Hydræ . . . . .	4.0	9	9	40.994	3.1239	+ 2	41	40.14	15.073
β Argûs . . . . .	2.0	9	12	12.971	+ 0.6718	- 69	20	47.10	- 14.816

† Periodic corrections given in the Appendix are still to be applied to the positions of Sirius and Procyon.

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Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
ε Argûs . . . . .	2.6	9	14	40.762	+ 1.6042	- 58	53	50.20	- 15.047
α Lyncis . . . . .	3.3	9	15	34.557	3.6648	+ 34	46	25.13	15.092
α Hydræ . . . . .	2.1	9	23	9.910	2.9487	- 8	16	4.87	15.500
1 Draconis (H.) . . . .	4.5	9	24	20.033	8.8392	+ 81	43	31.07	15.624
δ Ursæ Majoris . . . .	4.8	9	26	32.638	5.3686	+ 70	13	35.69	15.647
θ Ursæ Majoris . . . .	3.2	9	26	50.697	+ 4.0331	+ 52	5	17.13	- 16.278
10 Leonis Minoris . . . .	4.7	9	28	42.853	3.6866	+ 36	47	51.62	15.856
η Leonis . . . . .	3.8	9	36	20.934	+ 3.2054	+ 10	18	8.20	16.269
ζ Chamæleontis . . . .	5.2	9	36	33.875	- 1.6362	- 80	32	13.27	16.228
ε Leonis . . . . .	3.2	9	40	44.714	+ 3.4118	+ 24	11	20.45	16.480
μ Leonis . . . . .	4.0	9	47	38.834	+ 3.4181	+ 26	25	52.52	- 16.850
19 Leonis Minoris . . . .	5.2	9	52	10.599	3.6868	+ 41	29	4.92	17.030
π Leonis . . . . .	5.0	9	55	27.513	3.1726	+ 8	28	35.05	17.185
α Leonis ( <i>Regulus</i> ) . . .	1.3	10	3	34.833	3.1987	+ 12	24	26.66	17.517
32 Ursæ Majoris . . . .	5.7	10	11	30.673	4.3990	+ 65	33	27.89	17.854
λ Ursæ Majoris . . . .	3.6	10	11	40.476	+ 3.6330	+ 43	21	51.22	- 17.887
γ <sup>1</sup> Leonis . . . . .	2.5	10	15	0.756	3.3123	+ 20	17	49.67	18.131
μ Hydræ . . . . .	4.1	10	21	44.233	2.9003	- 16	22	35.45	18.311
β Leonis Minoris . . . .	4.3	10	22	41.021	3.4806	+ 37	10	7.11	18.378
α Antliæ . . . . .	4.5	10	23	1.919	2.7419	- 30	36	34.40	18.301
9 Draconis (H.) . . . .	5.0	10	27	28.429	+ 5.1980	+ 76	10	37.22	- 18.444
ρ Leonis . . . . .	4.0	10	28	4.427	3.1620	+ 9	46	12.18	18.458
41 Leonis Minoris . . . .	5.1	10	38	31.504	3.2679	+ 23	39	35.44	18.783
η Argûs ( <i>var.</i> ) . . . .	1-6	10	41	33.991	2.3197	- 59	12	40.30	18.893
ι Leonis . . . . .	5.3	10	44	31.690	3.1568	+ 11	1	17.71	19.002
δ <sup>2</sup> Chamæleontis . . . .	4.7	10	44	56.847	+ 0.5991	- 80	3	55.74	- 18.984
46 Leonis Minoris . . . .	3.9	10	48	16.926	3.3648	+ 34	42	1.23	19.355
Groombridge 1706 . . . .	6.3	10	52	46.995	4.9039	+ 78	15	9.17	19.225
α Ursæ Majoris . . . .	2.0	10	58	11.024	+ 3.7326	+ 62	14	13.48	19.392
η Octantis . . . . .	6.1	10	59	57.74*	- 0.3392	- 84	6	35.04	19.367
ρ <sup>3</sup> Leonis . . . . .	6.2	11	2	18.816	+ 3.0614	+ 2	26	39.75	- 19.494
ψ Ursæ Majoris . . . .	3.2	11	4	36.538	3.3869	+ 44	59	13.30	19.496
δ Leonis . . . . .	2.7	11	9	19.456	3.1959	+ 21	1	0.92	19.699
ν Ursæ Majoris . . . .	3.7	11	13	37.259	3.2491	+ 33	35	8.04	19.611
δ Crateris . . . . .	3.9	11	14	50.394	2.9971	- 14	17	28.93	19.463
τ Leonis . . . . .	5.1	11	23	18.555	+ 3.0858	+ 3	21	7.33	- 19.806
λ Draconis . . . . .	4.0	11	26	4.443	3.6018	+ 69	49	40.50	19.847
ξ Hydræ . . . . .	3.8	11	28	34.383	2.9454	- 31	21	34.62	19.912
υ Leonis . . . . .	4.4	11	32	20.440	3.0716	- 0	19	36.30	19.861
χ Ursæ Majoris . . . .	3.9	11	41	18.185	3.1818	+ 48	16	42.46	19.959
β Leonis . . . . .	2.2	11	44	28.215	+ 3.0628	+ 15	4	30.76	- 20.118
γ Ursæ Majoris . . . .	2.4	11	49	6.159	3.1721	+ 54	11	42.61	20.019
π Virginis . . . . .	4.6	11	56	15.661	3.0743	+ 7	6	58.25	20.075
η Virginis . . . . .	4.3	12	0	37.508	3.0572	+ 9	13	58.04	20.014
ε Corvi . . . . .	3.2	12	5	29.640	3.0805	- 22	7	9.34	20.038
4 Draconis (H.) . . . .	5.1	12	7	59.704	+ 2.8536	+ 78	6	58.81	- 20.014
γ Corvi . . . . .	2.7	12	11	10.534	3.0811	- 17	2	31.80	20.006
2 Canum Venaticorum . .	6.0	12	11	37.241	+ 3.0172	+ 41	9	39.72	- 20.066

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Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		<i>h</i>	<i>m</i>	<i>s</i>	<i>s</i>	<i>°</i>	<i>'</i>	<i>"</i>	<i>"</i>
$\beta$ Chamæleontis . . . . .	4.5	12	13	2.711	+ 3.4382	- 78	48	44.96	- 19.997
6 Ursæ Minoris (B.) . . . . .	6.2	12	14	25.971	0.3250	+ 88	11	55.72	19.948
$\eta$ Virginis . . . . .	4.0	12	15	18.083	3.0692	- 0	10	0.12	20.029
$\alpha^1$ Crucis . . . . .	0.9	12	21	35.004	3.3086	- 62	36	1.46	19.997
$\delta^2$ Corvi . . . . .	3.1	12	25	12.358	3.1006	- 16	0	51.98	20.073
$\beta$ Canum Venaticorum . . . . .	4.4	12	29	28.341	+ 2.8574	+ 41	50	47.01	- 19.601
$\kappa$ Draconis . . . . .	3.8	12	29	38.876	2.5802	+ 70	17	3.32	19.868
$\beta$ Corvi . . . . .	2.8	12	29	39.389	3.1446	- 22	53	56.84	19.940
$\gamma$ Virginis ( <i>mean</i> ) . . . . .	2.9	12	37	6.011	3.0396	- 0	57	21.18	19.780
31 Comæ Berenices . . . . .	5.1	12	47	18.938	2.9244	+ 28	1	49.01	19.644
32 <sup>a</sup> Camelopardalis (H.) . . . . .	5.2	12	48	27.367	+ 0.4288	+ 83	54	7.55	- 19.583
$\alpha$ Canum Venaticorum . . . . .	3.2	12	51	49.181	2.8113	+ 38	48	15.37	19.487
$\delta$ Muscæ . . . . .	3.8	12	56	3.763	4.0655	- 71	3	48.84	19.480
$\epsilon$ Virginis . . . . .	3.1	12	57	41.808	2.9865	+ 11	26	33.73	19.399
$\theta$ Virginis . . . . .	4.6	13	5	17.313	3.1028	- 5	3	31.35	19.278
20 Canum Venaticorum . . . . .	4.7	13	13	30.577	+ 2.6963	+ 41	2	46.64	- 19.009
$\alpha$ Virginis ( <i>Spica</i> ) . . . . .	1.1	13	20	26.992	3.1565	- 10	41	30.24	18.856
$\kappa$ Octantis . . . . .	5.4	13	26	11.22*	8.9990	- 85	19	31.66	18.668
$\zeta$ Virginis . . . . .	3.6	13	30	6.354	3.0542	- 0	8	9.47	18.477
B. A. C. 4536 . . . . .	5.0	13	30	46.799	2.6822	+ 37	38	35.99	18.498
<i>m</i> Virginis . . . . .	5.4	13	36	53.185	+ 3.1447	- 8	14	56.87	- 18.249
$\eta$ Ursæ Majoris . . . . .	1.9	13	43	59.764	2.3684	+ 49	45	43.81	18.040
$\gamma$ Bootis . . . . .	2.8	13	50	23.971	2.8568	+ 18	50	54.82	18.128
$\theta$ Apodis ( <i>var.</i> ) . . . . .	5.0	13	56	31.551	5.7249	- 76	21	46.15	17.539
$\beta$ Centauri . . . . .	0.7	13	57	27.801	4.2015	- 59	56	21.07	17.503
$\pi$ Hydræ . . . . .	3.6	14	1	14.580	+ 3.4083	- 26	14	57.08	- 17.452
$\alpha$ Draconis . . . . .	3.7	14	1	57.183	1.6242	+ 64	48	20.83	17.263
$\delta$ Bootis . . . . .	4.8	14	6	17.704	2.7371	+ 25	31	3.34	17.156
$\kappa$ Virginis . . . . .	4.2	14	8	5.579	+ 3.1962	- 9	51	18.60	16.863
4 Ursæ Minoris . . . . .	4.9	14	9	11.038	- 0.2890	+ 77	58	13.32	16.919
$\alpha$ Bootis ( <i>Arcturus</i> ) . . . . .	0.2	14	11	33.353	+ 2.7354	+ 19	39	2.19	- 18.836
$\delta$ Octantis . . . . .	5.0	14	12	23.180	9.1933	- 83	15	23.55	16.808
$\lambda$ Bootis . . . . .	4.3	14	12	57.823	2.2834	+ 46	30	4.53	16.615
$\lambda$ Virginis . . . . .	4.7	14	14	14.228	3.2401	- 12	57	25.98	16.684
$\theta$ Bootis . . . . .	4.1	14	22	8.026	+ 2.0434	+ 52	15	59.18	16.718
5 Ursæ Minoris . . . . .	4.5	14	27	42.130	- 0.1685	+ 76	5	46.17	- 16.004
$\rho$ Bootis . . . . .	3.6	14	27	57.102	+ 2.5866	+ 30	45	57.96	15.898
$\alpha^2$ Centauri . . . . .	0.2	14	33	28.677	4.0510	- 60	27	51.85	14.991
33 Bootis . . . . .	5.3	14	35	29.330	2.2343	+ 44	47	33.03	15.650
$\alpha$ Apodis . . . . .	4.1	14	36	37.950	7.2730	- 78	39	48.66	15.568
$\epsilon$ Bootis . . . . .	2.6	14	41	3.393	+ 2.6203	+ 27	27	11.52	- 15.287
$\alpha^3$ Libræ . . . . .	2.9	14	45	53.813	+ 3.3130	- 15	40	5.61	15.096
$\beta$ Ursæ Minoris . . . . .	2.2	14	50	57.503	- 0.2096	+ 74	31	23.86	14.720
$\beta$ Bootis . . . . .	3.7	14	58	33.362	+ 2.2600	+ 40	44	42.52	14.304
$\gamma$ Scorpii . . . . .	3.4	14	58	47.980	3.5038	- 24	55	43.21	14.296
$\delta$ Bootis . . . . .	3.5	15	11	52.471	+ 2.4192	+ 33	39	0.35	- 13.547
$\beta$ Libræ . . . . .	2.9	15	12	9.720	+ 3.2242	- 9	3	4.83	13.427
$\gamma^2$ Ursæ Minoris . . . . .	3.2	15	20	51.877	- 0.1194	+ 72	9	15.19	- 12.814

MEAN PLACES FOR 1910.0. (January 0<sup>d</sup>.521, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s		°	'	"	
$\mu^1$ Bootis . . . . .	4.5	15	21	5.431	+ 2.2663	+ 37	41	32.56	- 12.731
$\rho$ Octantis . . . . .	5.7	15	22	23.39*	13.2655	- 84	10	2.24	12.645
$\beta$ Coronæ Borealis . . . . .	3.9	15	24	7.106	2.4737	+ 29	24	55.73	12.529
$\alpha$ Coronæ Borealis . . . . .	2.3	15	30	52.616	2.5393	+ 27	1	1.43	12.242
$\alpha$ Serpentis . . . . .	2.7	15	39	50.031	2.9527	+ 6	42	29.68	11.467
$\epsilon$ Serpentis . . . . .	3.7	15	46	19.707	+ 2.9880	+ 4	44	53.56	- 10.971
$\zeta$ Ursæ Minoris . . . . .	4.6	15	47	15.137	- 2.2136	+ 78	4	18.27	10.976
$\epsilon$ Coronæ Borealis . . . . .	4.1	15	53	51.633	+ 2.4821	+ 27	8	16.69	10.551
$\delta$ Scorpii . . . . .	2.6	15	55	0.537	3.5415	- 22	21	58.27	10.433
$\beta^1$ Scorpii . . . . .	2.9	16	0	12.057	3.4828	- 19	33	34.86	10.036
$\varphi$ Herculis . . . . .	4.2	16	5	56.036	+ 1.8895	+ 45	10	13.80	- 9.534
Groombridge 2320 . . . . .	5.5	16	6	4.406	0.1508	+ 68	2	49.54	9.508
$\delta^1$ Apodis . . . . .	4.9	16	6	51.782	8.8367	- 78	28	13.82	9.554
$\delta$ Ophiuchi . . . . .	2.8	16	9	37.667	3.1411	- 3	27	47.31	9.429
$\sigma$ Coronæ Borealis . . . . .	5.3	16	11	18.468	2.2457	+ 34	5	10.90	9.226
$\tau$ Herculis . . . . .	3.9	16	17	2.134	+ 1.8029	+ 46	31	38.13	- 8.677
$\gamma$ Apodis . . . . .	4.0	16	19	36.941	+ 9.0865	- 78	41	47.63	8.585
$\eta$ Ursæ Minoris . . . . .	5.0	16	20	7.286	- 1.7961	+ 75	57	47.07	8.210
$\eta$ Draconis . . . . .	2.8	16	22	46.237	+ 0.8069	+ 61	43	3.79	8.194
$\alpha$ Scorpii ( <i>Antares</i> ) . . . . .	1.2	16	23	53.206	3.6734	- 26	13	58.54	8.191
$\beta$ Herculis . . . . .	2.8	16	26	20.990	+ 2.5772	+ 21	41	6.35	- 7.990
A Draconis . . . . .	5.0	16	28	9.237	- 0.1317	+ 68	57	46.33	7.784
$\zeta$ Ophiuchi . . . . .	2.8	16	32	12.090	+ 3.3004	- 10	23	7.48	7.471
$\alpha$ Trianguli Australis . . . . .	2.2	16	39	7.500	6.3191	- 68	51	48.84	6.977
$\eta$ Herculis . . . . .	3.7	16	39	48.594	2.0556	+ 39	5	34.45	6.965
$\kappa$ Ophiuchi . . . . .	3.4	16	53	24.448	+ 2.8380	+ 9	30	51.58	- 5.754
$\epsilon$ Ursæ Minoris . . . . .	4.5	16	55	9.326	- 6.2737	+ 82	11	12.15	5.597
$d$ Herculis . . . . .	5.3	16	58	16.932	+ 2.2119	+ 33	41	52.80	5.342
$\eta$ Ophiuchi . . . . .	2.5	17	5	12.889	3.4371	- 15	36	50.78	4.655
$\alpha^1$ Herculis ( <i>var.</i> ) . . . . .	3.2	17	10	32.589	2.7343	+ 14	29	32.21	4.263
$\pi$ Herculis . . . . .	3.4	17	11	54.697	+ 2.0883	+ 36	54	36.30	- 4.176
$\theta$ Ophiuchi . . . . .	3.3	17	16	28.849	3.6814	- 24	54	37.53	3.819
$b$ Ophiuchi ( <i>var.</i> ) . . . . .	4.4	17	20	52.322	3.6605	- 24	5	36.01	3.543
$\delta$ Aræ . . . . .	3.8	17	22	58.200	5.4045	- 60	36	35.83	3.345
$\beta$ Draconis . . . . .	3.0	17	28	23.913	1.3540	+ 52	22	3.64	2.746
$\alpha$ Ophiuchi . . . . .	2.2	17	30	45.371	+ 2.7836	+ 12	37	29.54	- 2.786
$\iota$ Herculis . . . . .	4.0	17	36	55.472	+ 1.6934	+ 46	3	13.84	2.012
$\omega$ Draconis . . . . .	4.9	17	37	28.620	- 0.3547	+ 68	47	58.57	1.649
$\mu$ Herculis . . . . .	3.5	17	42	56.144	+ 2.3469	+ 27	46	22.02	2.240
$\psi^1$ Draconis . . . . .	4.8	17	43	32.180	- 1.0752	+ 72	11	35.67	1.707
$\theta$ Herculis . . . . .	3.9	17	53	9.978	+ 2.0569	+ 37	15	43.00	- 0.593
$\gamma$ Draconis . . . . .	2.5	17	54	30.970	1.3923	+ 51	29	56.83	0.504
$\gamma^1$ Sagittarii . . . . .	2.9	18	0	1.519	+ 3.8519	- 30	25	33.33	- 0.196
$\delta$ Ursæ Minoris . . . . .	4.4	18	1	17.79*	- 19.4970	+ 86	36	50.74	+ 0.161
$\sigma$ Herculis . . . . .	3.9	18	4	1.883	+ 2.3393	+ 28	44	58.38	0.354
$\mu$ Sagittarii . . . . .	4.1	18	8	22.834	+ 3.5870	- 21	4	59.09	+ 0.731
$\eta$ Serpentis . . . . .	3.5	18	16	39.128	3.1027	- 2	55	21.90	0.764
$\lambda$ Sagittarii . . . . .	2.9	18	22	24.992	+ 3.7028	- 25	28	20.08	+ 1.759

MEAN PLACES FOR 1910.0. (January 0<sup>d</sup>.521, Washington.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ' "	"
$\gamma$ Draconis . . . . .	3.8	18 22 40.901	- 1.0781	+ 72 41 38.19	+ 1.608
$\iota$ Aquilæ . . . . .	4.0	18 30 18.567	+ 3.2646	- 8 18 27.46	2.328
$\zeta$ Pavonis . . . . .	4.2	18 32 31.290	7.0222	- 71 30 23.14	2.671
$\alpha$ Lyræ ( <i>Vega</i> ) . . . . .	0.2	18 33 53.475	2.0314	+ 38 41 57.90	3.234
$\beta$ Lyræ ( <i>var.</i> ) . . . . .	3.6	18 46 45.416	+ 2.2147	+ 33 15 27.64	4.056
50 Draconis . . . . .	5.6	18 49 17.018	- 1.9172	+ 75 19 40.87	+ 4.329
$\sigma$ Sagittarii . . . . .	2.3	18 49 41.073	+ 3.7203	- 26 24 33.44	4.237
$\gamma$ Lyræ . . . . .	3.3	18 55 34.593	2.2434	+ 32 33 56.00	4.808
$\zeta$ Aquilæ . . . . .	3.1	19 1 16.399	2.7569	+ 13 43 44.65	5.197
$\epsilon$ Lyræ . . . . .	5.2	19 4 5.431	+ 2.1412	+ 35 57 30.50	5.527
$\lambda$ Ursæ Minoris . . . . .	6.5	19 10 58.28*	- 70.4003	+ 89 0 21.78	+ 6.116
$\delta$ Sagittarii . . . . .	5.0	19 12 22.181	+ 3.5113	- 19 6 49.45	6.209
$\delta$ Draconis . . . . .	3.1	19 12 32.256	0.0235	+ 67 30 11.56	6.327
$\theta$ Lyræ . . . . .	4.4	19 13 14.622	2.0808	+ 37 58 22.99	6.304
$\sigma$ Octantis . . . . .	5.6	19 16 26.78*	+ 98.1577	- 89 14 17.76	6.561
$\tau$ Draconis . . . . .	4.5	19 17 17.480	- 1.1327	+ 73 11 19.21	+ 6.743
$\delta$ Aquilæ . . . . .	3.5	19 20 57.644	+ 3.0250	+ 2 56 5.00	7.016
$\beta$ Cygni . . . . .	3.1	19 27 5.494	2.4188	+ 27 46 12.35	7.426
$\kappa$ Aquilæ . . . . .	5.0	19 32 3.036	3.2290	- 7 13 41.11	7.838
$\beta$ Sagittæ . . . . .	4.5	19 37 0.386	2.6939	+ 17 16 1.17	8.202
$\gamma$ Aquilæ . . . . .	2.8	19 41 58.854	+ 2.8520	+ 10 23 36.02	+ 8.625
$\delta$ Cygni . . . . .	2.9	19 42 9.765	1.8760	+ 44 54 38.37	8.687
$\alpha$ Aquilæ ( <i>Altair</i> ) . . . . .	0.9	19 46 23.534	+ 2.9272	+ 8 37 48.02	9.353
$\epsilon$ Draconis . . . . .	3.9	19 48 29.059	- 0.1854	+ 70 2 19.25	9.165
$\epsilon$ Pavonis . . . . .	4.1	19 50 11.779	+ 6.9956	- 73 8 55.95	9.152
$\beta$ Aquilæ . . . . .	3.9	19 50 53.547	+ 2.9469	+ 6 10 53.08	+ 8.845
$\gamma$ Sagittæ . . . . .	3.6	19 54 45.260	2.6673	+ 19 14 49.83	9.648
$\epsilon$ Sagittarii . . . . .	4.5	19 57 7.555	3.6936	- 27 57 38.48	9.818
$\tau$ Aquilæ . . . . .	5.7	19 59 44.620	2.9309	+ 7 1 25.05	10.033
$\theta$ Aquilæ . . . . .	3.3	20 6 39.699	3.0962	- 1 5 20.27	10.529
31 Cygni . . . . .	3.9	20 10 47.901	+ 1.8901	+ 46 28 4.81	+ 10.835
$\kappa$ Cephei ( <i>pr.</i> ) . . . . .	4.4	20 11 56.270	- 1.9569	+ 77 26 26.67	10.939
$\alpha$ Capricorni . . . . .	3.7	20 13 3.732	+ 3.3309	- 12 49 27.67	11.003
$\alpha$ Pavonis . . . . .	2.1	20 18 31.982	4.7673	- 57 1 27.11	11.300
$\gamma$ Cygni . . . . .	2.3	20 18 59.879	2.1525	+ 39 58 5.42	11.427
$\pi$ Capricorni . . . . .	5.1	20 22 10.259	+ 3.4369	- 18 30 25.94	+ 11.650
$\epsilon$ Delphini . . . . .	4.0	20 28 54.812	+ 2.8665	+ 10 59 48.60	12.103
Groombridge 3241 . . . . .	6.5	20 30 24.186	- 0.2353	+ 72 13 36.51	12.213
$\alpha$ Delphini . . . . .	3.9	20 35 27.480	+ 2.7868	+ 15 35 39.37	12.595
$\beta$ Pavonis . . . . .	3.4	20 36 51.566	5.4490	- 66 31 38.74	12.671
$\alpha$ Cygni . . . . .	1.4	20 38 21.806	+ 2.0446	+ 44 57 29.93	+ 12.773
$\psi$ Capricorni . . . . .	4.3	20 40 46.153	3.5575	- 25 35 40.81	12.789
$\epsilon$ Cygni . . . . .	2.6	20 42 34.177	2.4273	+ 33 37 57.74	13.383
$\mu$ Aquarii . . . . .	4.8	20 47 48.041	+ 3.2382	- 9 19 17.79	13.362
12 Year Catalogue 1879 . . . . .	5.3	20 51 42.085	- 2.6123	+ 80 12 55.02	13.627
$\nu$ Cygni . . . . .	4.1	20 53 49.041	+ 2.2354	+ 40 49 12.73	+ 13.769
61 <sup>1</sup> Cygni . . . . .	5.4	21 2 51.669	2.6850	+ 38 18 22.87	17.597
$\zeta$ Cygni . . . . .	3.3	21 9 6.312	+ 2.5519	+ 29 51 26.31	+ 14.665



MEAN PLACES FOR 1910.0. (January 0<sup>d</sup>.521, Washington.)

Name of Star.	Magni- tude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	'	"	"
τ Cygni . . . . .	3.8	21	11	11.878	+ 2.3938	+ 37	39	39.07	+ 15.284
α Cephei . . . . .	2.6	21	16	25.977	1.4353	+ 62	12	14.48	15.203
ι Pegasi . . . . .	4.3	21	17	55.446	2.7740	+ 19	25	8.52	15.303
ζ Capricorni . . . . .	3.8	21	21	31.879	3.4311	- 22	48	5.71	15.462
β Aquarii . . . . .	2.9	21	26	49.322	3.1603	- 5	58	3.24	15.722
β Cephei ( <i>pr.</i> ) . . . . .	3.4	21	27	30.226	+ 0.7878	+ 70	9	55.78	+ 15.775
ξ Aquarii . . . . .	4.8	21	32	57.719	3.1961	- 8	15	29.61	16.037
74 Cygni . . . . .	5.0	21	33	20.468	2.4030	+ 40	0	31.84	16.089
λ <sup>1</sup> Octantis . . . . .	5.4	21	37	12.691	9.5874	- 83	8	1.06	16.267
ε Pegasi . . . . .	2.4	21	39	45.930	2.9462	+ 9	27	43.07	16.409
ιι Cephei . . . . .	4.8	21	40	36.395	+ 0.8898	+ 70	53	48.68	+ 16.544
π <sup>2</sup> Cygni . . . . .	4.5	21	43	28.038	2.2141	+ 48	53	34.25	16.592
μ Capricorni . . . . .	5.2	21	48	23.429	3.2736	- 13	58	33.30	16.831
16 Pegasi . . . . .	5.1	21	48	57.984	2.7281	+ 25	30	5.11	16.864
79 Draconis . . . . .	6.6	21	51	44.210	0.7212	+ 73	16	34.96	17.003
α Aquarii . . . . .	3.0	22	1	9.720	+ 3.0822	- 0	45	26.53	+ 17.409
α Gruis . . . . .	1.9	22	2	33.915	3.7960	- 47	23	50.57	17.297
π <sup>2</sup> Pegasi . . . . .	4.3	22	5	59.359	2.6622	+ 32	44	10.63	17.598
θ Aquarii . . . . .	4.4	22	12	5.124	3.1676	- 8	13	54.10	17.846
υ Octantis . . . . .	6.2	22	14	41.75*	12.5214	- 86	25	33.62	18.041
γ Aquarii . . . . .	4.0	22	17	0.491	+ 3.0993	- 1	50	27.77	+ 18.071
π Aquarii . . . . .	4.6	22	20	40.844	3.0639	+ 0	55	13.31	18.192
σ Aquarii . . . . .	4.9	22	25	53.150	3.1775	- 11	8	19.39	18.354
α Lacertæ . . . . .	3.9	22	27	34.925	2.4672	+ 49	49	10.24	18.452
226 Cephei (B.) . . . . .	5.7	22	30	41.774	1.0666	+ 75	45	45.20	18.543
η Aquarii . . . . .	4.2	22	30	43.921	+ 3.0833	- 0	34	53.78	+ 18.492
10 Lacertæ . . . . .	5.0	22	35	13.282	2.6882	+ 38	34	53.66	18.679
β Octantis . . . . .	4.4	22	36	54.693	6.3532	- 81	51	13.63	18.745
ζ Pegasi . . . . .	3.5	22	36	58.386	2.9913	+ 10	21	40.52	18.731
λ Pegasi . . . . .	4.1	22	42	11.675	2.8865	+ 23	5	30.49	18.893
ι Cephei . . . . .	3.6	22	46	28.415	+ 2.1269	+ 65	43	36.68	+ 18.897
λ Aquarii . . . . .	3.8	22	47	55.195	3.1312	- 8	3	31.42	19.098
α Pis. Austr. ( <i>Fomalhaut</i> ) . . . . .	1.3	22	52	40.800	3.3220	- 30	5	58.13	19.016
α Andromedæ . . . . .	3.8	22	57	46.636	2.7536	+ 41	50	31.56	19.302
α Pegasi ( <i>Markab</i> ) . . . . .	2.5	23	0	16.599	2.9861	+ 14	43	15.08	19.330
φ Aquarii . . . . .	4.3	23	9	39.699	+ 3.1074	- 6	32	3.68	+ 19.370
α Cephei . . . . .	5.1	23	14	55.513	2.4496	+ 67	37	8.31	19.677
τ Pegasi . . . . .	4.6	23	16	10.826	2.9652	+ 23	14	51.16	19.669
θ Piscium . . . . .	4.3	23	23	24.124	3.0419	+ 5	53	4.48	19.750
λ Andromedæ . . . . .	3.8	23	33	9.334	2.9268	+ 45	58	13.79	19.489
ι Piscium . . . . .	4.3	23	35	19.235	+ 3.0842	+ 5	8	18.31	+ 19.494
γ Cephei . . . . .	3.5	23	35	38.795	2.4349	+ 77	7	48.19	20.090
ι <sup>2</sup> Aquarii . . . . .	5.2	23	39	32.094	3.1149	- 18	46	35.65	19.960
δ Sculptoris . . . . .	4.6	23	44	14.344	3.1285	- 28	37	41.95	19.866
γ <sup>2</sup> Octantis . . . . .	5.2	23	46	51.080	3.6313	- 82	31	8.44	20.001
Groombridge 4163 . . . . .	6.6	23	50	26.315	+ 2.8753	+ 73	54	34.05	+ 20.024
ω Piscium . . . . .	4.2	23	54	41.341	+ 3.0793	+ 6	21	54.39	+ 19.933

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hrv.).			δ Ursæ Min. (B.).			δ Ursæ Min.			λ Ursæ Min.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.
Jan.	h m 1 26	° +88 49	Jan.	h m 6 58	° +87 11	Jan.	h m 12 14	° +88 11	Jan.	h m 18 1	° +86 36	Jan.	h m 19 9	° +89 0
	s	"		s	"		s	"		s	"		s	"
0.3	52.24	49.2	0.5	59.17	34.3	0.7	37.32	41.2	0.9	0.83	43.9	1.0	57.56	19.6
1.3	51.13	49.3	1.5	59.27	34.6	1.7	38.09	41.2	1.9	0.89	43.6	2.0	57.30	19.2
2.3	50.05	49.4	2.5	59.33	35.0	2.7	38.81	41.2	2.9	0.95	43.2	3.0	57.08	18.9
3.3	49.02	49.4	3.5	59.38	35.3	3.7	39.50	41.2	3.9	1.00	42.9	4.0	56.88	18.6
4.3	48.03	49.5	4.5	59.45	35.6	4.7	40.15	41.2	4.9	1.06	42.6	5.0	56.67	18.3
5.3	47.08	49.6	5.5	59.53	35.9	5.7	40.79	41.2	5.9	1.10	42.3	6.0	56.44	18.0
6.3	46.16	49.7	6.5	59.62	36.1	6.7	41.44	41.2	6.9	1.12	42.0	7.0	56.16	17.7
7.3	45.24	49.8	7.5	59.73	36.4	7.7	42.11	41.1	7.9	1.15	41.6	8.0	55.83	17.4
8.3	44.27	49.9	8.5	59.84	36.7	8.7	42.81	41.1	8.9	1.16	41.3	8.9	55.49	17.1
9.3	43.26	50.0	9.5	59.95	37.0	9.7	43.54	41.1	9.9	1.18	41.0	9.9	55.15	16.7
10.3	42.19	50.1	10.5	60.06	37.4	10.7	44.31	41.1	10.9	1.22	40.6	10.9	54.85	16.4
11.3	41.06	50.2	11.5	60.16	37.7	11.7	45.11	41.1	11.9	1.28	40.2	11.9	54.60	16.0
12.2	39.89	50.3	12.5	60.22	38.1	12.7	45.91	41.1	12.9	1.36	39.8	12.9	54.42	15.7
13.2	38.69	50.4	13.5	60.25	38.5	13.7	46.70	41.2	13.9	1.47	39.5	13.9	54.34	15.3
14.2	37.50	50.4	14.5	60.26	38.8	14.7	47.47	41.3	14.9	1.60	39.1	14.9	54.33	14.9
15.2	36.35	50.4	15.5	60.25	39.2	15.7	48.20	41.4	15.9	1.73	38.8	15.9	54.39	14.6
16.2	35.25	50.4	16.5	60.21	39.5	16.7	48.88	41.5	16.9	1.87	38.5	16.9	54.48	14.2
17.2	34.21	50.4	17.5	60.16	39.8	17.7	49.53	41.6	17.9	2.01	38.2	17.9	54.58	13.9
18.2	33.23	50.4	18.5	60.13	40.1	18.7	50.15	41.7	18.9	2.14	37.9	18.9	54.66	13.6
19.2	32.27	50.4	19.5	60.10	40.4	19.7	50.76	41.8	19.9	2.26	37.6	19.9	54.72	13.3
20.2	31.32	50.4	20.4	60.08	40.7	20.7	51.37	41.9	20.9	2.37	37.3	20.9	54.74	13.0
21.2	30.37	50.5	21.4	60.08	41.0	21.7	52.00	41.9	21.9	2.47	37.0	21.9	54.73	12.7
22.2	29.39	50.5	22.4	60.07	41.3	22.7	52.66	42.0	22.9	2.58	36.7	22.9	54.70	12.4
23.2	28.35	50.5	23.4	60.07	41.6	23.7	53.35	42.1	23.9	2.71	36.4	23.9	54.70	12.0
24.2	27.25	50.5	24.4	60.06	41.9	24.7	54.07	42.2	24.9	2.85	36.0	24.9	54.76	11.7
25.2	26.10	50.5	25.4	60.01	42.3	25.7	54.81	42.3	25.9	3.02	35.7	25.9	54.89	11.4
26.2	24.92	50.5	26.4	59.94	42.6	26.7	55.54	42.4	26.9	3.21	35.4	26.9	55.10	11.0
27.2	23.73	50.5	27.4	59.84	43.0	27.7	56.26	42.5	27.9	3.42	35.0	27.9	55.40	10.6
28.2	22.56	50.4	28.4	59.70	43.4	28.7	56.95	42.7	28.9	3.65	34.7	28.9	55.79	10.2
29.2	21.43	50.3	29.4	59.53	43.7	29.7	57.60	42.9	29.9	3.89	34.4	29.9	56.24	9.9
30.2	20.35	50.2	30.4	59.36	44.0	30.7	58.20	43.0	30.9	4.14	34.2	30.9	56.73	9.6
31.2	19.33	50.1	31.4	59.19	44.3	31.6	58.76	43.2	31.9	4.38	33.9	31.9	57.20	9.3
32.2	18.36	50.0	32.4	59.01	44.5	32.6	59.29	43.4	32.9	4.60	33.7	32.9	57.66	9.0

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Feb.	h m 1 25	° +88 49	Feb.	h m 6 58	° +87 11	Feb.	h m 12 14	° +88 11	Feb.	h m 18 1	° +86 36	Feb.	h m 19 9	° +89 0
	s	"		s	"		s	"		s	"		s	"
1.2	78.36	50.0	1.4	59.01	44.5	1.6	59.29	43.4	1.9	4.60	33.7	1.9	57.66	9.0
2.2	77.44	50.0	2.4	58.85	44.8	2.6	59.81	43.5	2.9	4.82	33.4	2.9	58.08	8.8
3.2	76.54	49.9	3.4	58.70	45.1	3.6	60.33	43.7	3.9	5.02	33.2	3.9	58.45	8.5
4.2	75.62	49.8	4.4	58.58	45.3	4.6	60.87	43.8	4.9	5.22	33.0	4.9	58.79	8.2
5.2	74.66	49.7	5.4	58.45	45.6	5.6	61.44	43.9	5.9	5.42	32.7	5.9	59.11	7.9
6.2	73.66	49.7	6.4	58.33	45.9	6.6	62.04	44.1	6.9	5.63	32.4	6.9	59.46	7.6
7.2	72.62	49.6	7.4	58.18	46.2	7.6	62.66	44.3	7.9	5.85	32.1	7.9	59.86	7.3
8.2	71.54	49.5	8.4	58.02	46.5	8.6	63.29	44.5	8.9	6.10	31.8	8.9	60.33	6.9
9.2	70.43	49.4	9.4	57.83	46.9	9.6	63.92	44.7	9.9	6.37	31.6	9.9	60.87	6.6
10.2	69.34	49.3	10.4	57.60	47.2	10.6	64.52	44.9	10.9	6.66	31.3	10.9	61.49	6.3
11.2	68.27	49.2	11.4	57.36	47.5	11.6	65.08	45.2	11.9	6.96	31.1	11.9	62.18	6.0
12.2	67.26	49.0	12.4	57.10	47.8	12.6	65.59	45.4	12.9	7.27	30.8	12.9	62.91	5.7
13.2	66.31	48.8	13.4	56.83	48.0	13.6	66.06	45.7	13.8	7.57	30.6	13.9	63.66	5.4
14.2	65.43	48.6	14.4	56.55	48.3	14.6	66.50	45.9	14.8	7.86	30.4	14.9	64.41	5.2
15.2	64.61	48.5	15.4	56.29	48.5	15.6	66.90	46.2	15.8	8.15	30.3	15.9	65.12	4.9
16.2	63.82	48.3	16.4	56.04	48.7	16.6	67.29	46.4	16.8	8.42	30.1	16.9	65.78	4.7
17.2	63.04	48.2	17.4	55.81	48.9	17.6	67.69	46.6	17.8	8.68	29.9	17.9	66.40	4.5
18.2	62.25	48.0	18.4	55.59	49.2	18.6	68.11	46.8	18.8	8.93	29.7	18.9	67.00	4.2
19.1	61.43	47.9	19.4	55.37	49.4	19.6	68.55	47.1	19.8	9.19	29.5	19.9	67.61	4.0
20.1	60.56	47.7	20.4	55.15	49.6	20.6	69.03	47.3	20.8	9.47	29.3	20.9	68.25	3.7
21.1	59.65	47.6	21.4	54.90	49.9	21.6	69.52	47.5	21.8	9.76	29.1	21.9	68.95	3.4
22.1	58.70	47.4	22.4	54.62	50.2	22.6	70.01	47.8	22.8	10.08	28.9	22.9	69.72	3.2
23.1	57.74	47.2	23.4	54.32	50.4	23.6	70.48	48.0	23.8	10.42	28.7	23.9	70.58	2.9
24.1	56.80	47.0	24.4	53.98	50.7	24.6	70.92	48.3	24.8	10.78	28.5	24.9	71.53	2.6
25.1	55.90	46.8	25.4	53.63	50.9	25.6	71.32	48.6	25.8	11.15	28.3	25.9	72.53	2.4
26.1	55.06	46.5	26.4	53.26	51.1	26.6	71.67	48.9	26.8	11.52	28.2	26.9	73.56	2.1
27.1	54.30	46.2	27.4	52.89	51.3	27.6	71.97	49.2	27.8	11.89	28.1	27.9	74.60	1.9
28.1	53.61	46.0	28.4	52.51	51.5	28.6	72.23	49.5	28.8	12.24	28.0	28.9	75.63	1.7
29.1	52.97	45.8	29.3	52.16	51.7	29.6	72.47	49.8	29.8	12.57	27.9	29.9	76.61	1.5
30.1	52.35	45.5	30.3	51.82	51.8	30.6	72.70	50.0	30.8	12.90	27.8	30.9	77.54	1.4

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hev.).			6 Ursæ Min. (B).			δ Ursæ Min.			ζ Ursæ Min.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.
Mar.	h m 1 25	° +88 49	Mar.	h m 6 58	° +87 11	Mar.	h m 12 15	° +88 11	Mar.	h m 18 1	° +86 36	Mar.	h m 19 10	° +88 59
	s	"		s	"		s	"		s	"		s	"
1.1	52.97	45.8	1.3	52.16	51.7	1.6	12.47	49.8	1.8	12.57	27.9	1.9	16.61	61.5
2.1	52.35	45.5	2.3	51.82	51.8	2.6	12.70	50.0	2.8	12.90	27.8	2.9	17.54	61.4
3.1	51.75	45.3	3.3	51.49	52.0	3.6	12.94	50.3	3.8	13.22	27.7	3.8	18.41	61.2
4.1	51.13	45.1	4.3	51.18	52.2	4.6	13.20	50.6	4.8	13.52	27.6	4.8	19.26	61.0
5.1	50.49	44.9	5.3	50.88	52.3	5.6	13.49	50.8	5.8	13.82	27.5	5.8	20.11	60.8
6.1	49.81	44.7	6.3	50.56	52.5	6.6	13.80	51.1	6.8	14.14	27.4	6.8	20.99	60.6
7.1	49.08	44.4	7.3	50.23	52.7	7.6	14.13	51.4	7.8	14.48	27.2	7.8	21.91	60.4
8.1	48.34	44.2	8.3	49.89	52.9	8.6	14.44	51.7	8.8	14.84	27.1	8.8	22.88	60.2
9.1	47.61	44.0	9.3	49.52	53.1	9.5	14.73	52.0	9.8	15.21	27.0	9.8	23.94	60.0
10.1	46.90	43.7	10.3	49.12	53.3	10.5	14.99	52.3	10.8	15.59	26.9	10.8	25.07	59.8
11.1	46.25	43.4	11.3	48.71	53.5	11.5	15.21	52.7	11.8	15.98	26.8	11.8	26.23	59.6
12.1	45.67	43.1	12.3	48.29	53.6	12.5	15.36	53.0	12.8	16.36	26.8	12.8	27.41	59.5
13.1	45.17	42.8	13.3	47.87	53.7	13.5	15.47	53.4	13.8	16.74	26.7	13.8	28.58	59.4
14.1	44.73	42.5	14.3	47.46	53.8	14.5	15.54	53.7	14.8	17.09	26.7	14.8	29.72	59.3
15.1	44.35	42.2	15.3	47.06	53.9	15.5	15.60	54.0	15.8	17.43	26.7	15.8	30.81	59.2
16.1	44.01	41.9	16.3	46.69	54.0	16.5	15.66	54.3	16.8	17.75	26.7	16.8	31.84	59.1
17.1	43.66	41.7	17.3	46.34	54.0	17.5	15.73	54.6	17.8	18.07	26.7	17.8	32.83	59.0
18.1	43.29	41.4	18.3	45.98	54.1	18.5	15.82	54.8	18.8	18.38	26.7	18.8	33.80	58.9
19.1	42.88	41.2	19.3	45.63	54.2	19.5	15.94	55.1	19.8	18.70	26.6	19.8	34.78	58.8
20.1	42.43	41.0	20.3	45.28	54.4	20.5	16.08	55.4	20.8	19.04	26.6	20.8	35.80	58.6
21.1	41.95	40.7	21.3	44.91	54.5	21.5	16.22	55.7	21.7	19.39	26.5	21.8	36.88	58.5
22.1	41.46	40.4	22.3	44.51	54.6	22.5	16.35	56.0	22.7	19.77	26.5	22.8	38.03	58.4
23.1	40.98	40.1	23.3	44.08	54.7	23.5	16.46	56.4	23.7	20.16	26.5	23.8	39.25	58.3
24.1	40.54	39.8	24.3	43.63	54.8	24.5	16.52	56.7	24.7	20.56	26.5	24.8	40.53	58.2
25.0	40.16	39.5	25.3	43.17	54.9	25.5	16.53	57.0	25.7	20.96	26.5	25.8	41.84	58.1
26.0	39.84	39.1	26.3	42.70	54.9	26.5	16.50	57.4	26.7	21.36	26.6	26.8	43.17	58.0
27.0	39.61	38.8	27.3	42.24	55.0	27.5	16.43	57.7	27.7	21.75	26.6	27.8	44.47	58.0
28.0	39.44	38.5	28.3	41.80	55.0	28.5	16.32	58.0	28.7	22.12	26.7	28.8	45.71	58.0
29.0	39.32	38.2	29.3	41.38	55.0	29.5	16.19	58.3	29.7	22.46	26.8	29.8	46.90	58.0
30.0	39.22	37.9	30.3	40.98	55.0	30.5	16.06	58.6	30.7	22.78	26.9	30.8	48.03	57.9
31.0	39.12	37.6	31.3	40.59	55.0	31.5	15.96	58.8	31.7	23.10	26.9	31.8	49.10	57.9
32.0	38.99	37.3	32.3	40.21	55.0	32.5	15.88	59.1	32.7	23.41	27.0	32.8	50.15	57.9

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>a</i> Ursæ Min. ( <i>Polaris</i> ).		Mean Solar Date.	51 Cephei ( <i>Hrv.</i> )		Mean Solar Date.	6 Ursæ Min. ( <i>B.</i> )		Mean Solar Date.	<i>δ</i> Ursæ Min.		Mean Solar Date.	<i>λ</i> Ursæ Min.	
	Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .
Apr.	h m 1 25	° +88 49	Apr.	h m 6 58	° +87 11	Apr.	h m 12 15	° +88 11	Apr.	h m 18 1	° +86 36	Apr.	h m 19 10	° +88 59
	s "	"		s "	"		s "	"		s "	"		s "	"
1.0	38.99	37.3	1.3	40.21	55.0	1.5	15.88	59.1	1.7	23.41	27.0	1.8	50.15	57.9
2.0	38.84	37.1	2.3	39.84	55.0	2.5	15.82	59.4	2.7	23.73	27.0	2.8	51.21	57.9
3.0	38.65	36.8	3.3	39.47	55.0	3.5	15.78	59.7	3.7	24.05	27.1	3.8	52.29	57.8
4.0	38.44	36.5	4.3	39.09	55.1	4.5	15.74	60.0	4.7	24.39	27.1	4.8	53.42	57.8
5.0	38.22	36.2	5.3	38.69	55.1	5.5	15.69	60.3	5.7	24.75	27.2	5.8	54.60	57.7
6.0	38.04	35.9	6.3	38.26	55.1	6.5	15.61	60.6	6.7	25.11	27.2	6.8	55.85	57.7
7.0	37.90	35.6	7.2	37.82	55.1	7.5	15.48	61.0	7.7	25.48	27.3	7.8	57.13	57.7
8.0	37.82	35.2	8.2	37.37	55.1	8.5	15.30	61.3	8.7	25.84	27.4	8.8	58.42	57.7
9.0	37.81	34.9	9.2	36.92	55.1	9.5	15.07	61.6	9.7	26.19	27.6	9.7	59.69	57.7
10.0	37.88	34.6	10.2	36.48	55.0	10.5	14.80	61.9	10.7	26.53	27.7	10.7	60.94	57.8
11.0	38.01	34.2	11.2	36.06	54.9	11.5	14.51	62.2	11.7	26.85	27.9	11.7	62.13	57.8
12.0	38.19	33.9	12.2	35.67	54.8	12.5	14.21	62.5	12.7	27.14	28.1	12.7	63.25	57.9
13.0	38.39	33.6	13.2	35.30	54.8	13.5	13.92	62.8	13.7	27.42	28.2	13.7	64.30	58.0
13.9	38.57	33.4	14.2	34.95	54.7	14.5	13.65	63.0	14.7	27.69	28.4	14.7	65.31	58.1
14.9	38.73	33.1	15.2	34.61	54.6	15.4	13.42	63.3	15.7	27.96	28.5	15.7	66.31	58.1
15.9	38.84	32.9	16.2	34.26	54.6	16.4	13.21	63.5	16.7	28.24	28.6	16.7	67.32	58.2
16.9	38.91	32.6	17.2	33.90	54.5	17.4	13.00	63.8	17.7	28.53	28.7	17.7	68.37	58.2
17.9	38.96	32.3	18.2	33.52	54.5	18.4	12.79	64.0	18.7	28.84	28.9	18.7	69.48	58.2
18.9	39.01	32.0	19.2	33.12	54.4	19.4	12.57	64.3	19.7	29.17	29.0	19.7	70.66	58.3
19.9	39.08	31.7	20.2	32.71	54.4	20.4	12.32	64.6	20.7	29.50	29.1	20.7	71.88	58.3
20.9	39.22	31.4	21.2	32.27	54.3	21.4	12.02	64.9	21.7	29.83	29.3	21.7	73.14	58.4
21.9	39.42	31.0	22.2	31.83	54.2	22.4	11.66	65.2	22.7	30.15	29.5	22.7	74.40	58.5
22.9	39.70	30.7	23.2	31.41	54.0	23.4	11.26	65.5	23.7	30.47	29.7	23.7	75.65	58.6
23.9	40.05	30.4	24.2	31.00	53.9	24.4	10.83	65.8	24.7	30.77	29.9	24.7	76.83	58.7
24.9	40.46	30.1	25.2	30.62	53.8	25.4	10.39	66.0	25.7	31.04	30.2	25.7	77.95	58.9
25.9	40.90	29.8	26.2	30.26	53.6	26.4	9.94	66.2	26.7	31.29	30.4	26.7	79.00	59.0
26.9	41.34	29.5	27.2	29.92	53.4	27.4	9.51	66.4	27.7	31.51	30.6	27.7	79.97	59.2
27.9	41.76	29.2	28.2	29.61	53.3	28.4	9.10	66.6	28.7	31.73	30.8	28.7	80.89	59.4
28.9	42.15	29.0	29.2	29.31	53.1	29.4	8.73	66.8	29.6	31.95	31.0	29.7	81.79	59.5
29.9	42.50	28.8	30.2	29.01	53.0	30.4	8.38	67.0	30.6	32.18	31.2	30.7	82.71	59.6
30.9	42.83	28.5	31.2	28.69	52.9	31.4	8.04	67.2	31.6	32.41	31.4	31.7	83.65	59.7
31.9	43.14	28.3	32.2	28.37	52.8	32.4	7.69	67.4	32.6	32.66	31.6	32.7	84.63	59.8

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
May	h m 1 25	° +88 49	May	h m 6 58	° +87 11	May	h m 12 14	° +88 12	May	h m 18 1	° +86 36	May	h m 19 11	° +88 59
	s	"		s	"		s	"		s	"		s	"
1.9	43.14	28.3	1.2	28.69	52.9	1.4	68.04	7.2	1.6	32.41	31.4	1.7	23.65	59.7
2.9	43.46	28.0	2.2	28.37	52.8	2.4	67.69	7.4	2.6	32.66	31.6	2.7	24.63	59.8
3.9	43.81	27.7	3.2	28.03	52.7	3.4	67.32	7.7	3.6	32.92	31.8	3.7	25.67	59.9
4.9	44.22	27.4	4.2	27.67	52.5	4.4	66.91	7.9	4.6	33.18	32.0	4.7	26.74	60.1
5.9	44.71	27.2	5.2	27.31	52.4	5.4	66.46	8.2	5.6	33.43	32.2	5.7	27.82	60.2
6.9	45.27	26.9	6.2	26.95	52.2	6.4	65.97	8.4	6.6	33.67	32.5	6.7	28.89	60.4
7.9	45.89	26.6	7.2	26.60	52.0	7.4	65.45	8.7	7.6	33.89	32.8	7.7	29.92	60.6
8.9	46.56	26.3	8.2	26.27	51.8	8.4	64.89	8.9	8.6	34.10	33.1	8.7	30.88	60.8
9.9	47.26	26.1	9.2	25.97	51.5	9.4	64.31	9.1	9.6	34.29	33.4	9.7	31.77	61.0
10.9	47.94	25.9	10.2	25.70	51.3	10.4	63.74	9.2	10.6	34.45	33.6	10.7	32.59	61.3
11.9	48.60	25.7	11.2	25.46	51.1	11.4	63.19	9.4	11.6	34.60	33.9	11.7	33.34	61.5
12.9	49.23	25.5	12.2	25.23	50.9	12.4	62.68	9.5	12.6	34.74	34.2	12.7	34.05	61.7
13.9	49.80	25.3	13.1	25.01	50.7	13.4	62.20	9.6	13.6	34.88	34.4	13.7	34.77	61.9
14.9	50.33	25.1	14.1	24.78	50.5	14.4	61.74	9.8	14.6	35.03	34.7	14.7	35.50	62.1
15.9	50.85	24.9	15.1	24.53	50.3	15.4	61.29	10.0	15.6	35.20	34.9	15.7	36.28	62.2
16.9	51.39	24.7	16.1	24.27	50.1	16.4	60.83	10.1	16.6	35.38	35.1	16.7	37.10	62.4
17.9	51.97	24.4	17.1	24.00	49.9	17.4	60.36	10.3	17.6	35.58	35.4	17.6	37.97	62.6
18.9	52.61	24.2	18.1	23.71	49.7	18.4	59.85	10.4	18.6	35.77	35.6	18.6	38.87	62.8
19.9	53.31	23.9	19.1	23.41	49.5	19.4	59.29	10.6	19.6	35.96	35.9	19.6	39.79	63.0
20.9	54.08	23.7	20.1	23.11	49.3	20.4	58.68	10.8	20.6	36.13	36.2	20.6	40.68	63.3
21.9	54.91	23.5	21.1	22.83	49.0	21.3	58.04	10.9	21.6	36.29	36.6	21.6	41.52	63.5
22.9	55.77	23.3	22.1	22.58	48.7	22.3	57.38	11.0	22.6	36.42	36.9	22.6	42.30	63.8
23.9	56.64	23.1	23.1	22.36	48.5	23.3	56.72	11.1	23.6	36.52	37.2	23.6	43.00	64.1
24.9	57.50	22.9	24.1	22.16	48.2	24.3	56.08	11.2	24.6	36.61	37.5	24.6	43.61	64.4
25.9	58.33	22.8	25.1	21.98	47.9	25.3	55.47	11.3	25.6	36.69	37.8	25.6	44.15	64.6
26.9	59.12	22.6	26.1	21.83	47.6	26.3	54.89	11.4	26.6	36.75	38.1	26.6	44.65	64.9
27.9	59.86	22.5	27.1	21.70	47.4	27.3	54.34	11.4	27.6	36.81	38.4	27.6	45.15	65.1
28.9	60.58	22.3	28.1	21.55	47.1	28.3	53.81	11.5	28.6	36.88	38.6	28.6	45.66	65.4
29.9	61.28	22.2	29.1	21.39	46.9	29.3	53.29	11.6	29.6	36.97	38.9	29.6	46.19	65.6
30.9	62.00	22.0	30.1	21.23	46.7	30.3	52.75	11.7	30.6	37.07	39.2	30.6	46.77	65.8
31.9	62.77	21.8	31.1	21.05	46.5	31.3	52.20	11.8	31.6	37.16	39.4	31.6	47.39	66.1
32.9	63.60	21.7	32.1	20.86	46.2	32.3	51.61	11.9	32.6	37.26	39.7	32.6	48.02	66.3

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hæv.).			6 Ursæ Min. (B.).			δ Ursæ Min.			γ Ursæ Min.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.
June	h m	° '	June	h m	° '	June	h m	° '	June	h m	° '	June	h m	° '
	1 26	+88 49		6 58	+87 11		12 14	+88 12		18 1	+86 36		19 11	+89 0
	s	"		s	"		s	"		s	"		s	"
1.9	3.60	21.7	1.1	20.86	46.2	1.3	51.61	11.9	1.6	37.26	39.7	1.6	48.02	6.3
2.9	4.50	21.5	2.1	20.66	45.9	2.3	50.97	12.0	2.6	37.35	40.0	2.6	48.65	6.6
3.9	5.47	21.3	3.1	20.48	45.6	3.3	50.30	12.1	3.6	37.42	40.4	3.6	49.23	6.9
4.9	6.49	21.2	4.1	20.33	45.3	4.3	49.60	12.2	4.6	37.47	40.7	4.6	49.75	7.2
5.9	7.53	21.1	5.1	20.20	45.0	5.3	48.88	12.2	5.5	37.50	41.1	5.6	50.20	7.5
6.9	8.56	21.0	6.1	20.09	44.7	6.3	48.17	12.3	6.5	37.50	41.4	6.6	50.56	7.8
7.8	9.57	20.9	7.1	20.02	44.4	7.3	47.48	12.3	7.5	37.49	41.8	7.6	50.85	8.2
8.8	10.54	20.8	8.1	19.97	44.1	8.3	46.83	12.3	8.5	37.46	42.1	8.6	51.08	8.5
9.8	11.45	20.7	9.1	19.92	43.8	9.3	46.21	12.3	9.5	37.44	42.4	9.6	51.30	8.8
10.8	12.32	20.6	10.1	19.88	43.5	10.3	45.63	12.3	10.5	37.41	42.7	10.6	51.52	9.0
11.8	13.16	20.6	11.1	19.84	43.3	11.3	45.07	12.3	11.5	37.40	42.9	11.6	51.77	9.3
12.8	13.99	20.5	12.1	19.78	43.0	12.3	44.50	12.3	12.5	37.40	43.2	12.6	52.06	9.6
13.8	14.84	20.4	13.1	19.70	42.8	13.3	43.93	12.3	13.5	37.42	43.5	13.6	52.40	9.8
14.8	15.74	20.3	14.1	19.60	42.5	14.3	43.34	12.3	14.5	37.44	43.8	14.6	52.77	10.1
15.8	16.70	20.2	15.1	19.50	42.2	15.3	42.70	12.3	15.5	37.45	44.1	15.6	53.16	10.4
16.8	17.72	20.0	16.1	19.41	41.9	16.3	42.02	12.3	16.5	37.47	44.4	16.6	53.54	10.7
17.8	18.79	19.9	17.0	19.32	41.6	17.3	41.32	12.3	17.5	37.46	44.8	17.6	53.88	11.0
18.8	19.90	19.9	18.0	19.25	41.2	18.3	40.60	12.3	18.5	37.42	45.1	18.6	54.15	11.4
19.8	21.03	19.8	19.0	19.21	40.9	19.3	39.87	12.2	19.5	37.37	45.5	19.6	54.33	11.7
20.8	22.15	19.8	20.0	19.20	40.6	20.3	39.15	12.2	20.5	37.29	45.8	20.6	54.42	12.1
21.8	23.23	19.8	21.0	19.23	40.2	21.3	38.46	12.1	21.5	37.18	46.2	21.6	54.44	12.4
22.8	24.26	19.8	22.0	19.27	39.9	22.3	37.81	12.0	22.5	37.08	46.5	22.6	54.41	12.7
23.8	25.23	19.8	23.0	19.33	39.6	23.3	37.20	11.9	23.5	36.97	46.8	23.5	54.35	13.0
24.8	26.17	19.8	24.0	19.39	39.3	24.3	36.62	11.8	24.5	36.86	47.1	24.5	54.30	13.3
25.8	27.09	19.7	25.0	19.44	39.0	25.3	36.06	11.8	25.5	36.77	47.3	25.5	54.27	13.6
26.8	28.00	19.7	26.0	19.48	38.8	26.3	35.50	11.7	26.5	36.69	47.6	26.5	54.27	13.9
27.8	28.94	19.7	27.0	19.51	38.5	27.2	34.93	11.6	27.5	36.62	47.9	27.5	54.31	14.2
28.8	29.93	19.7	28.0	19.53	38.2	28.2	34.34	11.6	28.5	36.54	48.2	28.5	54.37	14.5
29.8	30.98	19.6	29.0	19.55	37.9	29.2	33.70	11.5	29.5	36.46	48.5	29.5	54.43	14.8
30.8	32.08	19.6	30.0	19.57	37.6	30.2	33.02	11.5	30.5	36.36	48.8	30.5	54.46	15.1
31.8	33.23	19.6	31.0	19.60	37.3	31.2	32.32	11.4	31.5	36.24	49.2	31.5	54.45	15.5

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hrv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
July	h m 1 26	° ' " +88 49	July	h m 6 58	° ' " +87 11	July	h m 12 14	° ' " +88 12	July	h m 18 1	° ' " +86 36	July	h m 19 11	° ' " +89 0
	s "			s "			s "			s "			s "	
1.8	33.23	19.6	1.0	19.60	37.3	1.2	32.32	11.4	1.5	36.24	49.2	1.5	54.45	15.5
2.8	34.42	19.6	2.0	19.67	36.9	2.2	31.61	11.3	2.5	36.11	49.5	2.5	54.36	15.8
3.8	35.61	19.7	3.0	19.76	36.6	3.2	30.90	11.2	3.5	35.94	49.8	3.5	54.19	16.2
4.8	36.76	19.7	4.0	19.88	36.2	4.2	30.22	11.1	4.5	35.75	50.2	4.5	53.93	16.6
5.8	37.87	19.8	5.0	20.02	35.9	5.2	29.57	10.9	5.5	35.55	50.5	5.5	53.60	16.9
6.8	38.93	19.9	6.0	20.19	35.6	6.2	28.95	10.8	6.5	35.35	50.8	6.5	53.24	17.2
7.8	39.94	19.9	6.9	20.36	35.3	7.2	28.38	10.6	7.5	35.16	51.0	7.5	52.87	17.5
8.8	40.90	20.0	7.9	20.53	35.0	8.2	27.84	10.4	8.5	34.97	51.3	8.5	52.52	17.8
9.8	41.82	20.1	8.9	20.68	34.7	9.2	27.31	10.3	9.5	34.79	51.5	9.5	52.21	18.1
10.8	42.77	20.1	9.9	20.81	34.5	10.2	26.78	10.2	10.5	34.63	51.8	10.5	51.95	18.4
11.8	43.73	20.2	10.9	20.93	34.2	11.2	26.24	10.0	11.5	34.49	52.0	11.5	51.73	18.7
12.8	44.74	20.2	11.9	21.04	33.9	12.2	25.67	9.9	12.4	34.34	52.3	12.5	51.54	19.0
13.8	45.81	20.2	12.9	21.15	33.6	13.2	25.06	9.7	13.4	34.18	52.6	13.5	51.35	19.3
14.8	46.94	20.3	13.9	21.27	33.3	14.2	24.42	9.6	14.4	34.01	52.9	14.5	51.12	19.6
15.7	48.10	20.4	14.9	21.40	32.9	15.2	23.76	9.4	15.4	33.82	53.2	15.5	50.84	20.0
16.7	49.26	20.4	15.9	21.56	32.6	16.2	23.09	9.2	16.4	33.60	53.5	16.5	50.48	20.3
17.7	50.42	20.5	16.9	21.75	32.3	17.2	22.43	9.0	17.4	33.36	53.8	17.5	50.03	20.7
18.7	51.55	20.7	17.9	21.96	31.9	18.2	21.80	8.8	18.4	33.11	54.1	18.5	49.51	21.0
19.7	52.64	20.8	18.9	22.19	31.6	19.2	21.21	8.6	19.4	32.84	54.4	19.5	48.92	21.4
20.7	53.66	21.0	19.9	22.45	31.3	20.2	20.66	8.3	20.4	32.57	54.7	20.5	48.29	21.7
21.7	54.62	21.1	20.9	22.72	31.0	21.2	20.15	8.1	21.4	32.30	54.9	21.5	47.66	22.0
22.7	55.55	21.3	21.9	22.97	30.7	22.2	19.67	7.9	22.4	32.04	55.1	22.5	47.05	22.3
23.7	56.46	21.4	22.9	23.21	30.5	23.2	19.21	7.7	23.4	31.80	55.3	23.5	46.46	22.5
24.7	57.38	21.5	23.9	23.44	30.3	24.2	18.74	7.5	24.4	31.56	55.5	24.5	45.92	22.8
25.7	58.34	21.6	24.9	23.66	30.0	25.2	18.26	7.3	25.4	31.33	55.8	25.5	45.41	23.1
26.7	59.35	21.7	25.9	23.87	29.7	26.2	17.75	7.1	26.4	31.10	56.0	26.5	44.91	23.4
27.7	60.41	21.8	26.9	24.09	29.4	27.2	17.20	6.9	27.4	30.86	56.3	27.5	44.39	23.7
28.7	61.52	22.0	27.9	24.32	29.1	28.2	16.62	6.7	28.4	30.60	56.5	28.5	43.84	24.0
29.7	62.66	22.1	28.9	24.56	28.8	29.2	16.02	6.5	29.4	30.32	56.8	29.5	43.22	24.3
30.7	63.80	22.3	29.9	24.83	28.5	30.2	15.43	6.2	30.4	30.01	57.1	30.5	42.53	24.7
31.7	64.92	22.5	30.9	25.13	28.2	31.2	14.86	6.0	31.4	29.69	57.3	31.4	41.75	25.0
32.7	66.00	22.7	31.9	25.47	27.9	32.1	14.32	5.7	32.4	29.35	57.6	32.4	40.89	25.3



## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (H $\gamma$ .).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Aug.	h m	°	Aug.	h m	°	Aug.	h m	°	Aug.	h m	°	Aug.	h m	°
	1 27	+88 49		6 58	+87 11		12 14	+88 11		18 1	+86 36		19 11	+89 0
	s	"		s	"		s	"		s	"		s	"
1.7	6.00	22.7	1.9	25.82	27.6	1.1	14.32	65.7	1.4	29.35	57.6	1.4	40.89	25.3
2.7	7.02	23.0	2.9	26.17	27.3	2.1	13.81	65.4	2.4	29.01	57.8	2.4	40.00	25.6
3.7	7.97	23.2	3.9	26.52	27.1	3.1	13.36	65.1	3.4	28.66	58.0	3.4	39.08	25.9
4.7	8.86	23.4	4.9	26.87	26.8	4.1	12.96	64.8	4.4	28.32	58.2	4.4	38.17	26.2
5.7	9.72	23.6	5.9	27.20	26.6	5.1	12.57	64.5	5.4	27.99	58.4	5.4	37.29	26.5
6.7	10.56	23.8	6.9	27.51	26.4	6.1	12.19	64.3	6.4	27.68	58.6	6.4	36.47	26.7
7.7	11.42	24.0	7.9	27.80	26.1	7.1	11.80	64.0	7.4	27.39	58.7	7.4	35.70	26.9
8.7	12.31	24.2	8.9	28.08	25.9	8.1	11.39	63.8	8.4	27.11	58.9	8.4	34.97	27.2
9.7	13.24	24.3	9.9	28.37	25.6	9.1	10.95	63.5	9.4	26.82	59.1	9.4	34.25	27.4
10.7	14.22	24.5	10.9	28.67	25.4	10.1	10.48	63.2	10.4	26.52	59.4	10.4	33.52	27.7
11.7	15.24	24.7	11.9	29.00	25.1	11.1	9.99	63.0	11.4	26.21	59.6	11.4	32.74	28.0
12.7	16.29	24.9	12.9	29.35	24.8	12.1	9.49	62.7	12.4	25.87	59.8	12.4	31.89	28.3
13.7	17.33	25.1	13.9	29.73	24.5	13.1	9.00	62.4	13.4	25.51	60.0	13.4	30.97	28.6
14.7	18.34	25.4	14.9	30.13	24.2	14.1	8.53	62.0	14.4	25.13	60.2	14.4	29.96	28.9
15.7	19.31	25.6	15.9	30.54	24.0	15.1	8.10	61.7	15.4	24.74	60.4	15.4	28.88	29.2
16.7	20.21	25.9	16.9	30.97	23.8	16.1	7.71	61.3	16.4	24.35	60.6	16.4	27.76	29.5
17.7	21.04	26.2	17.9	31.40	23.6	17.1	7.37	61.0	17.3	23.96	60.7	17.4	26.63	29.8
18.7	21.82	26.5	18.9	31.81	23.4	18.1	7.07	60.6	18.3	23.58	60.8	18.4	25.52	30.0
19.6	22.56	26.7	19.9	32.21	23.2	19.1	6.79	60.3	19.3	23.21	61.0	19.4	24.44	30.2
20.6	23.30	27.0	20.9	32.60	23.0	20.1	6.52	60.0	20.3	22.86	61.1	20.4	23.39	30.4
21.6	24.08	27.2	21.9	32.98	22.8	21.1	6.23	59.7	21.3	22.51	61.2	21.4	22.39	30.6
22.6	24.88	27.5	22.9	33.35	22.6	22.1	5.92	59.4	22.3	22.16	61.4	22.4	21.42	30.8
23.6	25.72	27.7	23.9	33.72	22.4	23.1	5.58	59.1	23.3	21.82	61.5	23.4	20.44	31.0
24.6	26.62	28.0	24.9	34.11	22.1	24.1	5.21	58.8	24.3	21.46	61.7	24.4	19.43	31.3
25.6	27.55	28.2	25.9	34.53	21.9	25.1	4.83	58.5	25.3	21.08	61.8	25.4	18.38	31.6
26.6	28.49	28.5	26.9	34.97	21.6	26.1	4.45	58.2	26.3	20.69	62.0	26.4	17.26	31.8
27.6	29.42	28.8	27.9	35.43	21.4	27.1	4.07	57.8	27.3	20.27	62.2	27.4	16.06	32.1
28.6	30.30	29.1	28.9	35.92	21.2	28.1	3.72	57.4	28.3	19.82	62.3	28.4	14.79	32.3
29.6	31.13	29.5	29.9	36.42	21.0	29.1	3.41	57.1	29.3	19.38	62.4	29.4	13.47	32.6
30.6	31.89	29.8	30.8	36.91	20.8	30.1	3.16	56.7	30.3	18.93	62.5	30.4	12.12	32.8
31.6	32.57	30.1	31.8	37.40	20.6	31.1	2.95	56.3	31.3	18.50	62.6	31.4	10.78	33.0
32.6	33.20	30.5	32.8	37.88	20.5	32.1	2.77	55.9	32.3	18.08	62.7	32.4	9.46	33.2

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hev.).			6 Ursæ Min. (B.).			δ Ursæ Min.			ζ Ursæ Min.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.
Sept.	h m	°	Sept.	h m	°	Sept.	h m	°	Sept.	h m	°	Sept.	h m	°
	1 27	+88 49		6 58	+87 11		12 13	+88 11		18 1	+86 37		19 10	+89 0
	s	"		s	"		s	"		s	"		s	"
1.6	33.20	30.5	1.8	37.88	20.5	1.1	62.77	55.9	1.3	18.08	2.7	1.4	69.46	33.2
2.6	33.80	30.8	2.8	38.34	20.3	2.1	62.61	55.6	2.3	17.68	2.7	2.4	68.20	33.3
3.6	34.40	31.1	3.8	38.77	20.2	3.1	62.46	55.2	3.3	17.29	2.8	3.4	67.01	33.5
4.6	35.02	31.4	4.8	39.19	20.1	4.1	62.30	54.9	4.3	16.91	2.9	4.4	65.86	33.6
5.6	35.68	31.6	5.8	39.60	19.9	5.0	62.11	54.6	5.3	16.54	3.0	5.3	64.73	33.8
6.6	36.39	31.9	6.8	40.02	19.7	6.0	61.88	54.2	6.3	16.17	3.1	6.3	63.61	34.0
7.6	37.14	32.2	7.8	40.46	19.5	7.0	61.62	53.9	7.3	15.79	3.2	7.3	62.46	34.2
8.6	37.91	32.5	8.8	40.92	19.3	8.0	61.36	53.5	8.3	15.39	3.3	8.3	61.26	34.4
9.6	38.67	32.8	9.8	41.41	19.1	9.0	61.10	53.1	9.3	14.97	3.4	9.3	59.99	34.6
10.6	39.42	33.2	10.8	41.92	19.0	10.0	60.86	52.7	10.3	14.53	3.5	10.3	58.65	34.8
11.6	40.12	33.5	11.8	42.45	18.8	11.0	60.65	52.3	11.3	14.07	3.5	11.3	57.23	35.0
12.6	40.76	33.9	12.8	43.00	18.7	12.0	60.49	51.9	12.3	13.61	3.6	12.3	55.76	35.2
13.6	41.32	34.3	13.8	43.54	18.5	13.0	60.39	51.5	13.3	13.15	3.6	13.3	54.27	35.4
14.6	41.82	34.7	14.8	44.06	18.4	14.0	60.33	51.1	14.3	12.71	3.6	14.3	52.80	35.5
15.6	42.28	35.0	15.8	44.57	18.4	15.0	60.29	50.7	15.3	12.27	3.6	15.3	51.37	35.6
16.6	42.71	35.4	16.8	45.07	18.3	16.0	60.26	50.3	16.3	11.85	3.6	16.3	49.98	35.7
17.6	43.15	35.7	17.8	45.55	18.2	17.0	60.23	49.9	17.3	11.45	3.6	17.3	48.64	35.8
18.6	43.62	36.0	18.8	46.01	18.1	18.0	60.18	49.6	18.3	11.06	3.6	18.3	47.35	36.0
19.6	44.13	36.3	19.8	46.47	18.0	19.0	60.11	49.2	19.3	10.66	3.6	19.3	46.07	36.1
20.6	44.68	36.6	20.8	46.95	17.8	20.0	60.02	48.9	20.3	10.26	3.7	20.3	44.78	36.2
21.6	45.26	37.0	21.8	47.45	17.7	21.0	59.90	48.5	21.3	9.84	3.7	21.3	43.45	36.4
22.6	45.86	37.3	22.8	47.97	17.6	22.0	59.77	48.2	22.3	9.41	3.8	22.3	42.06	36.5
23.6	46.47	37.7	23.8	48.52	17.4	23.0	59.65	47.8	23.2	8.96	3.8	23.3	40.61	36.6
24.6	47.04	38.1	24.8	49.08	17.3	24.0	59.55	47.4	24.2	8.49	3.8	24.3	39.09	36.8
25.5	47.55	38.5	25.8	49.65	17.2	24.9	59.49	46.9	25.2	8.01	3.8	25.3	37.51	36.9
26.5	47.98	38.9	26.8	50.24	17.2	25.9	59.49	46.5	26.2	7.53	3.8	26.3	35.90	37.0
27.5	48.34	39.3	27.8	50.82	17.1	26.9	59.53	46.1	27.2	7.05	3.8	27.3	34.30	37.1
28.5	48.64	39.7	28.8	51.38	17.1	27.9	59.61	45.7	28.2	6.59	3.7	28.3	32.73	37.2
29.5	48.89	40.1	29.8	51.91	17.1	28.9	59.71	45.3	29.2	6.16	3.6	29.3	31.20	37.2
30.5	49.13	40.5	30.8	52.41	17.0	29.9	59.82	44.9	30.2	5.74	3.5	30.3	29.74	37.3
31.5	49.38	40.8	31.8	52.90	17.0	30.9	59.94	44.6	31.2	5.34	3.5	31.3	28.34	37.3
32.5	49.65	41.2	32.8	53.38	17.0	31.9	60.04	44.2	32.2	4.96	3.4	32.3	26.98	37.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hrv.).			6 Ursæ Min. (B.).			δ Ursæ Min.			λ Ursæ Min.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.
Oct.	h m	°	Oct.	h m	°	Oct.	h m	°	Oct.	h m	°	Oct.	h m	°
	1 27	+88 49		6 58	+87 11		12 14	+88 11		18 0	+86 36		19 9	+89 0
	s	"		s	"		s	"		s	"		s	"
1.5	49.38	40.8	1.8	52.90	17.0	1.9	0.04	44.2	1.2	65.34	63.5	1.3	88.34	37.3
2.5	49.65	41.2	2.8	53.35	17.0	2.9	0.09	43.8	2.2	64.96	63.4	2.3	86.98	37.4
3.5	49.97	41.5	3.8	53.86	16.9	3.9	0.12	43.5	3.2	64.57	63.4	3.3	85.65	37.4
4.5	50.32	41.9	4.8	54.35	16.8	4.9	0.14	43.1	4.2	64.17	63.3	4.3	84.31	37.5
5.5	50.70	42.2	5.8	54.85	16.8	5.9	0.15	42.7	5.2	63.76	63.3	5.3	82.94	37.6
6.5	51.09	42.6	6.8	55.38	16.7	6.9	0.18	42.3	6.2	63.34	63.3	6.3	81.53	37.7
7.5	51.46	43.0	7.7	55.93	16.6	7.9	0.23	41.9	7.2	62.90	63.2	7.3	80.03	37.8
8.5	51.79	43.4	8.7	56.49	16.6	8.9	0.33	41.4	8.2	62.44	63.2	8.3	78.47	37.8
9.5	52.06	43.8	9.7	57.07	16.5	9.9	0.47	41.0	9.2	61.98	63.1	9.3	76.87	37.9
10.5	52.26	44.2	10.7	57.65	16.5	10.9	0.67	40.6	10.2	61.52	63.0	10.3	75.24	37.9
11.5	52.37	44.6	11.7	58.22	16.5	11.9	0.91	40.2	11.2	61.08	62.9	11.3	73.62	37.9
12.5	52.44	45.0	12.7	58.77	16.6	12.9	1.15	39.8	12.2	60.64	62.8	12.3	72.03	37.9
13.5	52.46	45.4	13.7	59.31	16.6	13.9	1.40	39.4	13.2	60.22	62.6	13.2	70.49	37.9
14.5	52.48	45.8	14.7	59.83	16.7	14.9	1.65	39.1	14.2	59.83	62.5	14.2	69.01	37.9
15.5	52.53	46.2	15.7	60.33	16.7	15.9	1.88	38.7	15.2	59.44	62.4	15.2	67.60	37.9
16.5	52.61	46.5	16.7	60.82	16.7	16.9	2.07	38.4	16.2	59.06	62.2	16.2	66.22	37.8
17.5	52.73	46.9	17.7	61.32	16.7	17.9	2.24	38.0	17.2	58.68	62.1	17.2	64.84	37.8
18.5	52.89	47.2	18.7	61.83	16.7	18.9	2.39	37.7	18.2	58.29	62.0	18.2	63.44	37.9
19.5	53.07	47.6	19.7	62.36	16.7	19.9	2.55	37.3	19.2	57.88	61.9	19.2	62.00	37.9
20.5	53.24	48.0	20.7	62.91	16.7	20.9	2.72	36.9	20.2	57.46	61.8	20.2	60.51	37.9
21.5	53.39	48.4	21.7	63.48	16.7	21.9	2.93	36.5	21.2	57.03	61.7	21.2	58.96	37.9
22.5	53.49	48.8	22.7	64.06	16.7	22.9	3.18	36.1	22.2	56.59	61.6	22.2	57.35	37.9
23.5	53.52	49.3	23.7	64.65	16.8	23.9	3.48	35.7	23.2	56.14	61.5	23.2	55.71	37.9
24.5	53.47	49.7	24.7	65.23	16.9	24.9	3.83	35.3	24.2	55.70	61.3	24.2	54.07	37.9
25.5	53.36	50.1	25.7	65.79	17.0	25.9	4.21	35.0	25.2	55.28	61.1	25.2	52.46	37.8
26.5	53.19	50.5	26.7	66.34	17.1	26.9	4.61	34.6	26.2	54.88	60.9	26.2	50.90	37.7
27.5	52.98	50.9	27.7	66.85	17.2	27.9	5.01	34.3	27.2	54.50	60.7	27.2	49.41	37.6
28.5	52.78	51.3	28.7	67.33	17.3	28.9	5.40	33.9	28.2	54.14	60.5	28.2	47.99	37.5
29.5	52.60	51.6	29.7	67.80	17.4	29.9	5.75	33.6	29.1	53.80	60.3	29.2	46.63	37.4
30.5	52.44	52.0	30.7	68.26	17.4	30.9	6.07	33.3	30.1	53.47	60.1	30.2	45.31	37.4
31.5	52.33	52.3	31.7	68.74	17.5	31.9	6.37	33.0	31.1	53.13	59.9	31.2	44.02	37.3
32.4	52.25	52.6	32.7	69.21	17.6	32.9	6.67	32.6	32.1	52.79	59.8	32.2	42.71	37.2

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '
	1 27	+88 49		6 59	+87 11		12 14	+88 11		18 0	+86 36		19 9	+89 0
	s	"		s	"		s	"		s	"		s	"
1.4	52.25	52.6	1.7	9.21	17.6	1.9	6.67	32.6	1.1	52.79	59.8	1.2	42.71	37.2
2.4	52.19	53.0	2.7	9.70	17.6	2.9	6.97	32.3	2.1	52.43	59.6	2.2	41.36	37.2
3.4	52.12	53.4	3.7	10.21	17.7	3.9	7.28	31.9	3.1	52.06	59.4	3.2	39.95	37.1
4.4	52.01	53.8	4.7	10.75	17.8	4.9	7.64	31.5	4.1	51.68	59.3	4.2	38.49	37.1
5.4	51.84	54.2	5.7	11.29	17.9	5.9	8.05	31.1	5.1	51.28	59.1	5.2	36.99	37.0
6.4	51.61	54.6	6.7	11.83	18.0	6.9	8.50	30.8	6.1	50.90	58.9	6.2	35.46	36.9
7.4	51.30	55.0	7.7	12.37	18.2	7.9	8.99	30.4	7.1	50.53	58.6	7.2	33.92	36.8
8.4	50.93	55.4	8.7	12.89	18.3	8.9	9.51	30.1	8.1	50.17	58.4	8.2	32.43	36.6
9.4	50.51	55.8	9.7	13.38	18.5	9.9	10.03	29.8	9.1	49.82	58.1	9.2	31.00	36.5
10.4	50.06	56.1	10.7	13.85	18.7	10.9	10.55	29.5	10.1	49.50	57.8	10.2	29.63	36.3
11.4	49.63	56.5	11.6	14.30	18.9	11.9	11.06	29.2	11.1	49.20	57.6	11.2	28.32	36.1
12.4	49.23	56.8	12.6	14.74	19.0	12.9	11.53	28.9	12.1	48.92	57.3	12.2	27.07	36.0
13.4	48.87	57.1	13.6	15.17	19.2	13.9	11.97	28.6	13.1	48.63	57.1	13.2	25.86	35.8
14.4	48.54	57.4	14.6	15.61	19.3	14.9	12.39	28.4	14.1	48.34	56.8	14.2	24.64	35.7
15.4	48.25	57.8	15.6	16.06	19.4	15.9	12.81	28.1	15.1	48.04	56.6	15.2	23.40	35.5
16.4	47.98	58.1	16.6	16.53	19.6	16.9	13.24	27.8	16.1	47.72	56.4	16.2	22.13	35.4
17.4	47.68	58.5	17.6	17.01	19.7	17.9	13.70	27.5	17.1	47.40	56.2	17.1	20.80	35.3
18.4	47.33	58.8	18.6	17.50	19.8	18.9	14.19	27.2	18.1	47.06	56.0	18.1	19.42	35.2
19.4	46.92	59.2	19.6	18.01	20.0	19.8	14.72	26.9	19.1	46.72	55.7	19.1	18.01	35.0
20.4	46.44	59.6	20.6	18.51	20.2	20.8	15.31	26.6	20.1	46.39	55.4	20.1	16.59	34.8
21.4	45.89	60.0	21.6	18.99	20.4	21.8	15.93	26.3	21.1	46.07	55.1	21.1	15.20	34.6
22.4	45.28	60.3	22.6	19.45	20.7	22.8	16.57	26.0	22.1	45.77	54.8	22.1	13.86	34.4
23.4	44.62	60.7	23.6	19.88	20.9	23.8	17.21	25.7	23.1	45.50	54.5	23.1	12.59	34.2
24.4	43.96	61.0	24.6	20.28	21.1	24.8	17.84	25.5	24.1	45.26	54.2	24.1	11.42	34.0
25.4	43.31	61.3	25.6	20.65	21.4	25.8	18.45	25.3	25.1	45.04	53.9	25.1	10.33	33.7
26.4	42.68	61.6	26.6	21.01	21.6	26.8	19.02	25.1	26.1	44.83	53.6	26.1	9.28	33.5
27.4	42.11	61.8	27.6	21.37	21.8	27.8	19.57	24.8	27.1	44.63	53.3	27.1	8.27	33.3
28.4	41.56	62.1	28.6	21.73	22.0	28.8	20.10	24.6	28.1	44.42	53.0	28.1	7.27	33.1
29.4	41.04	62.4	29.6	22.10	22.2	29.8	20.62	24.4	29.1	44.20	52.7	29.1	6.26	32.9
30.4	40.52	62.7	30.6	22.49	22.3	30.8	21.15	24.1	30.1	43.97	52.5	30.1	5.20	32.7
31.4	39.98	63.0	31.6	22.88	22.5	31.8	21.71	23.8	31.1	43.73	52.2	31.1	4.10	32.5

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hæv.).			6 Ursæ Min. (B.).			δ Ursæ Min.			λ Ursæ Min.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.
Dec.	h m 1 27	° +88 50	Dec.	h m 6 59	° +87 11	Dec.	h m 12 14	° +88 11	Dec.	h m 18 0	° +86 36	Dec.	h m 19 8	° +89 0
	s	"		s	"		s	"		s	"		s	"
1.4	39.98	3.0	1.6	22.88	22.5	1.8	21.71	23.8	1.1	43.73	52.2	1.1	64.10	32.5
2.4	39.39	3.3	2.6	23.29	22.8	2.8	22.32	23.6	2.1	43.49	51.9	2.1	62.95	32.3
3.4	38.74	3.6	3.6	23.71	23.0	3.8	22.97	23.3	3.0	43.25	51.6	3.1	61.78	32.1
4.4	38.02	4.0	4.6	24.12	23.3	4.8	23.66	23.1	4.0	43.01	51.3	4.1	60.62	31.9
5.4	37.22	4.3	5.6	24.51	23.5	5.8	24.39	22.9	5.0	42.79	50.9	5.1	59.49	31.6
6.4	36.38	4.6	6.6	24.87	23.8	6.8	25.13	22.7	6.0	42.59	50.6	6.1	58.42	31.3
7.3	35.51	4.8	7.6	25.20	24.1	7.8	25.86	22.5	7.0	42.42	50.2	7.1	57.42	31.0
8.3	34.64	5.1	8.6	25.52	24.4	8.8	26.58	22.4	8.0	42.27	49.8	8.1	56.50	30.7
9.3	33.80	5.3	9.6	25.81	24.7	9.8	27.26	22.2	9.0	42.13	49.5	9.1	55.64	30.4
10.3	33.00	5.6	10.6	26.09	25.0	10.8	27.90	22.1	10.0	42.00	49.2	10.1	54.83	30.2
11.3	32.24	5.8	11.6	26.37	25.2	11.8	28.52	21.9	11.0	41.87	48.9	11.1	54.05	29.9
12.3	31.52	6.0	12.6	26.66	25.5	12.8	29.12	21.8	12.0	41.74	48.6	12.1	53.28	29.6
13.3	30.82	6.2	13.6	26.95	25.7	13.8	29.72	21.6	13.0	41.60	48.3	13.1	52.48	29.4
14.3	30.13	6.5	14.6	27.26	25.9	14.8	30.34	21.5	14.0	41.44	48.0	14.1	51.63	29.2
15.3	29.41	6.8	15.6	27.60	26.2	15.8	30.99	21.3	15.0	41.28	47.7	15.1	50.73	28.9
16.3	28.63	7.0	16.6	27.93	26.4	16.8	31.67	21.1	16.0	41.11	47.3	16.1	49.80	28.7
17.3	27.78	7.3	17.6	28.25	26.7	17.8	32.40	21.0	17.0	40.95	47.0	17.1	48.86	28.4
18.3	26.86	7.5	18.6	28.56	27.0	18.8	33.17	20.8	18.0	40.80	46.6	18.1	47.95	28.1
19.3	25.89	7.8	19.5	28.85	27.4	19.8	33.96	20.7	19.0	40.67	46.3	19.1	47.09	27.8
20.3	24.87	8.0	20.5	29.12	27.7	20.8	34.75	20.6	20.0	40.56	45.9	20.1	46.30	27.5
21.3	23.83	8.2	21.5	29.34	28.0	21.8	35.53	20.5	21.0	40.48	45.5	21.0	45.60	27.1
22.3	22.81	8.4	22.5	29.53	28.4	22.8	36.29	20.4	22.0	40.43	45.1	22.0	44.99	26.8
23.3	21.82	8.5	23.5	29.70	28.7	23.8	37.01	20.4	22.9	40.40	44.8	23.0	44.46	26.4
24.3	20.85	8.7	24.5	29.87	29.0	24.8	37.70	20.3	23.9	40.38	44.4	24.0	43.98	26.1
25.3	19.93	8.8	25.5	30.03	29.3	25.7	38.36	20.2	24.9	40.36	44.1	25.0	43.53	25.8
26.3	19.05	9.0	26.5	30.20	29.5	26.7	39.00	20.2	25.9	40.34	43.8	26.0	43.08	25.5
27.3	18.20	9.1	27.5	30.38	29.8	27.7	39.64	20.1	26.9	40.30	43.5	27.0	42.60	25.3
28.3	17.34	9.3	28.5	30.57	30.1	28.7	40.29	20.0	27.9	40.25	43.2	28.0	42.09	25.0
29.3	16.45	9.4	29.5	30.77	30.4	29.7	40.98	19.9	28.9	40.20	42.8	29.0	41.53	24.7
30.3	15.51	9.6	30.5	30.97	30.7	30.7	41.71	19.8	29.9	40.14	42.5	30.0	40.95	24.4
31.3	14.51	9.8	31.5	31.17	31.0	31.7	42.48	19.7	30.9	40.10	42.2	31.0	40.37	24.1
32.3	13.44	10.0	32.5	31.35	31.3	32.7	43.27	19.7	31.9	40.06	41.8	32.0	39.82	23.8

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Piscium.		$\alpha$ Andromedæ.		$\beta$ Cassiopeiz.		22 Andromedæ.		$\gamma$ Pegasi. (Algenib.)	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m ° °	° ' " - 6 12	h m ° °	° ' " +28 35	h m ° °	° ' " +58 38	h m ° °	° ' " +45 34	h m ° °	° ' " +14 40
Jan. 0.2	42.64	49.3	42.70	39.3	20.48	82.8	36.93	24.7	34.83	57.6
10.2	42.54	49.8	42.57	38.4	20.16	82.1	36.73	23.9	34.72	56.8
20.2	42.45	50.3	42.44	37.3	19.86	80.9	36.53	22.6	34.61	55.9
30.2	42.37	50.6	42.32	35.9	19.58	79.2	36.35	21.0	34.51	54.9
Feb. 9.1	42.30	50.7	42.22	34.4	19.34	77.1	36.20	19.1	34.43	53.9
19.1	42.26	50.7	42.14	32.8	19.15	74.7	36.08	17.0	34.37	52.9
Mar. 1.1	42.24	50.5	42.10	31.2	19.01	72.1	36.00	14.8	34.34	52.0
11.0	42.25	50.0	42.09	29.7	18.95	69.4	35.97	12.5	34.33	51.2
21.0	42.29	49.3	42.13	28.3	18.96	66.8	35.99	10.3	34.37	50.6
31.0	42.37	48.4	42.21	27.1	19.05	64.2	36.07	8.3	34.44	50.3
Apr. 10.0	42.49	47.3	42.33	26.2	19.22	61.9	36.21	6.6	34.56	50.2
19.9	42.65	45.9	42.50	25.7	19.46	60.0	36.40	5.2	34.71	50.4
29.9	42.85	44.3	42.72	25.5	19.78	58.5	36.65	4.2	34.91	50.9
May 9.9	43.09	42.5	42.98	25.7	20.16	57.4	36.95	3.6	35.15	51.8
19.9	43.35	40.5	43.27	26.3	20.59	56.8	37.30	3.5	35.42	52.9
29.8	43.64	38.5	43.58	27.3	21.06	56.7	37.67	3.9	35.71	54.3
June 8.8	43.95	36.4	43.92	28.6	21.55	57.2	38.06	4.8	36.02	56.0
18.8	44.27	34.3	44.27	30.3	22.06	58.2	38.46	6.1	36.34	57.9
28.7	44.59	32.2	44.62	32.3	22.57	59.7	38.87	7.8	36.67	60.0
July 8.7	44.91	30.2	44.96	34.4	23.06	61.6	39.27	9.9	36.99	62.1
18.7	45.21	28.4	45.28	36.8	23.52	64.0	39.64	12.3	37.30	64.3
28.7	45.49	26.8	45.58	39.3	23.95	66.7	39.99	14.9	37.59	66.5
Aug. 7.6	45.75	25.4	45.85	41.8	24.33	69.7	40.30	17.8	37.85	68.7
17.6	45.97	24.2	46.08	44.4	24.66	72.9	40.56	20.8	38.07	70.7
27.6	46.16	23.3	46.27	46.9	24.93	76.2	40.78	23.9	38.26	72.6
Sept. 6.6	46.31	22.7	46.43	49.3	25.13	79.6	40.96	26.9	38.42	74.4
16.5	46.42	22.4	46.54	51.6	25.27	83.1	41.08	29.9	38.53	75.9
26.5	46.49	22.3	46.61	53.7	25.35	86.5	41.16	32.9	38.61	77.2
Oct. 6.5	46.52	22.5	46.65	55.6	25.37	89.8	41.19	35.7	38.65	78.3
16.5	46.52	22.8	46.65	57.3	25.33	92.9	41.17	38.2	38.66	79.2
26.4	46.50	23.3	46.61	58.7	25.23	95.7	41.12	40.5	38.64	79.9
Nov. 5.4	46.45	23.9	46.55	59.8	25.08	98.2	41.03	42.5	38.60	80.3
15.4	46.38	24.6	46.47	60.7	24.89	100.4	40.91	44.1	38.53	80.5
25.3	46.29	25.4	46.37	61.2	24.65	102.1	40.76	45.3	38.45	80.6
Dec. 5.3	46.20	26.1	46.25	61.4	24.38	103.3	40.59	46.1	38.36	80.4
15.3	46.10	26.8	46.13	61.3	24.09	104.0	40.40	46.5	38.25	80.0
25.3	46.00	27.5	45.99	60.9	23.79	104.2	40.20	46.4	38.14	79.4
35.2	45.90	28.1	45.86	60.2	23.47	103.8	40.00	45.9	38.03	78.7

**FIXED STARS, 1910.**  
(CONSTANTS OF STRUVE AND PETERS.)

325

**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

Mean Solar Date.	$\sigma$ Andromedæ.		$\iota$ Ceti.		44 Piscium.		$\beta$ Hydri.		12 Ceti.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 0 13	° ' " +36 16	h m 0 14	° ' " - 9 19	h m 0 20	° ' " + 1 26	h m 0 20	° ' " -77 45	h m 0 25	° ' " - 4 26
Jan. 0.2	36.09	75.7	49.55	32.5	46.29	22.0	62.06	66.0	25.79	84.7
10.2	35.93	74.8	49.44	33.0	46.18	21.4	61.19	64.9	25.68	85.3
20.2	35.77	73.7	49.34	33.3	46.08	20.8	60.38	63.2	25.58	85.8
30.2	35.62	72.3	49.25	33.5	45.99	20.2	59.65	61.0	25.49	86.1
Feb. 9.1	35.49	70.7	49.17	33.5	45.91	19.7	59.02	58.3	25.40	86.3
19.1	35.39	68.9	49.12	33.3	45.85	19.4	58.51	55.2	25.34	86.4
Mar. 1.1	35.33	67.0	49.08	32.9	45.81	19.2	58.14	51.8	25.29	86.3
11.1	35.30	65.1	49.08	32.3	45.80	19.2	57.90	48.2	25.28	85.9
21.0	35.32	63.4	49.11	31.4	45.82	19.4	57.82	44.4	25.30	85.3
31.0	35.39	61.8	49.18	30.3	45.88	19.9	57.89	40.5	25.36	84.5
Apr. 10.0	35.51	60.5	49.28	29.0	45.98	20.6	58.12	36.6	25.45	83.5
19.9	35.68	59.5	49.43	27.4	46.12	21.5	58.50	32.8	25.59	82.2
29.9	35.90	58.9	49.62	25.7	46.30	22.7	59.04	29.2	25.76	80.7
May 9.9	36.16	58.7	49.84	23.8	46.52	24.2	59.72	25.9	25.98	79.0
19.9	36.47	58.9	50.10	21.7	46.78	25.8	60.52	22.8	26.23	77.1
29.8	36.80	59.6	50.38	19.6	47.06	27.7	61.43	20.1	26.50	75.1
June 8.8	37.15	60.6	50.69	17.4	47.36	29.6	62.44	17.9	26.80	73.0
18.8	37.52	62.1	51.01	15.2	47.67	31.7	63.51	16.2	27.12	70.8
28.8	37.89	63.9	51.33	13.1	47.99	33.8	64.62	15.0	27.44	68.7
July 8.7	38.25	66.0	51.65	11.2	48.31	35.8	65.74	14.4	27.76	66.7
18.7	38.59	68.3	51.96	9.4	48.62	37.8	66.85	14.3	28.07	64.8
28.7	38.91	70.8	52.25	7.8	48.91	39.7	67.91	14.8	28.36	63.1
Aug. 7.6	39.20	73.5	52.52	6.5	49.17	41.4	68.89	15.9	28.63	61.6
17.6	39.46	76.2	52.75	5.5	49.40	42.9	69.76	17.5	28.87	60.3
27.6	39.67	79.0	52.95	4.7	49.60	44.2	70.50	19.5	29.07	59.3
Sept. 6.6	39.84	81.7	53.11	4.3	49.77	45.3	71.08	22.0	29.24	58.6
16.5	39.97	84.3	53.23	4.1	49.90	46.1	71.49	24.7	29.38	58.1
26.5	40.06	86.8	53.32	4.2	49.99	46.6	71.72	27.6	29.47	57.9
Oct. 6.5	40.10	89.1	53.37	4.6	50.04	46.9	71.75	30.7	29.53	58.0
16.5	40.11	91.2	53.39	5.1	50.07	47.0	71.60	33.7	29.56	58.2
26.4	40.08	93.1	53.37	5.8	50.06	46.9	71.26	36.5	29.56	58.7
Nov. 5.4	40.02	94.7	53.33	6.6	50.03	46.7	70.77	39.0	29.53	59.2
15.4	39.93	96.0	53.27	7.4	49.98	46.3	70.13	41.2	29.48	59.9
25.3	39.82	96.9	53.19	8.3	49.91	45.8	69.38	42.9	29.41	60.6
Dec. 5.3	39.69	97.4	53.10	9.1	49.82	45.2	68.55	44.0	29.32	61.4
15.3	39.55	97.6	53.00	9.9	49.73	44.6	67.67	44.6	29.23	62.1
25.3	39.40	97.4	52.90	10.6	49.63	43.9	66.76	44.5	29.13	62.8
35.2	39.24	96.8	52.79	11.2	49.52	43.3	65.87	43.8	29.03	63.4

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\pi$ Andromedæ.		$\alpha$ Cassiopeizæ.		$\beta$ Ceti.		$\gamma$ Cassiopeizæ.		$\delta$ Cassiopeizæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 0 32	° ' " +33 13	h m 0 35	° ' " +56 2	h m 0 39	° ' " -18 28	h m 0 39	° ' " +74 29	h m 0 39	° ' " +47 47
Jan. 0.3	3.10	31.0	22.22	48.7	3.54	62.6	39.31	60.5	41.09	39.9
10.2	2.95	30.4	21.93	48.3	3.42	63.0	38.58	60.6	40.87	39.5
20.2	2.80	29.4	21.64	47.5	3.31	63.2	37.86	60.0	40.65	38.6
30.2	2.65	28.2	21.37	46.1	3.20	63.1	37.17	58.8	40.44	37.3
Feb. 9.1	2.52	26.7	21.12	44.4	3.10	62.8	36.54	57.1	40.25	35.7
19.1	2.41	25.1	20.91	42.3	3.02	62.2	35.99	55.0	40.08	33.8
Mar. 1.1	2.33	23.5	20.75	40.0	2.96	61.3	35.55	52.5	39.95	31.7
11.1	2.29	21.8	20.64	37.5	2.93	60.2	35.25	49.7	39.87	29.5
21.0	2.29	20.3	20.60	35.0	2.94	58.8	35.09	46.8	39.85	27.3
31.0	2.34	18.9	20.64	32.6	2.98	57.2	35.08	43.9	39.88	25.2
Apr. 10.0	2.44	17.7	20.75	30.3	3.06	55.3	35.22	41.0	39.98	23.3
20.0	2.58	16.8	20.93	28.3	3.18	53.2	35.52	38.4	40.14	21.7
29.9	2.78	16.3	21.19	26.7	3.35	51.0	35.97	36.1	40.36	20.4
May 9.9	3.02	16.1	21.51	25.5	3.55	48.7	36.54	34.2	40.63	19.5
19.9	3.30	16.3	21.89	24.7	3.80	46.3	37.22	32.8	40.95	19.0
29.8	3.62	17.0	22.32	24.4	4.07	43.8	37.99	31.8	41.32	19.0
June 8.8	3.96	18.0	22.77	24.7	4.37	41.4	38.83	31.4	41.72	19.5
18.8	4.31	19.4	23.25	25.4	4.69	39.1	39.71	31.6	42.13	20.4
28.8	4.67	21.1	23.74	26.6	5.02	37.0	40.60	32.3	42.55	21.7
July 8.7	5.03	23.1	24.22	28.2	5.35	35.0	41.49	33.5	42.97	23.5
18.7	5.38	25.3	24.68	30.3	5.68	33.3	42.34	35.2	43.38	25.6
28.7	5.70	27.6	25.12	32.7	5.99	31.9	43.15	37.4	43.76	28.0
Aug. 7.7	6.00	30.1	25.52	35.4	6.28	30.9	43.89	40.0	44.12	30.6
17.6	6.27	32.7	25.87	38.3	6.53	30.2	44.55	43.0	44.43	33.4
27.6	6.50	35.3	26.18	41.5	6.76	29.8	45.12	46.2	44.71	36.3
Sept. 6.6	6.69	37.9	26.43	44.7	6.95	29.8	45.58	49.7	44.94	39.3
16.5	6.84	40.3	26.62	48.0	7.10	30.1	45.93	53.3	45.12	42.3
26.5	6.94	42.7	26.76	51.3	7.21	30.7	46.16	57.0	45.25	45.3
Oct. 6.5	7.01	44.8	26.84	54.5	7.29	31.6	46.28	60.8	45.33	48.2
16.5	7.05	46.8	26.87	57.5	7.32	32.7	46.28	64.4	45.37	50.9
26.4	7.05	48.5	26.84	60.4	7.33	33.9	46.16	67.9	45.36	53.4
Nov. 5.4	7.01	50.0	26.76	63.0	7.30	35.2	45.92	71.2	45.32	55.7
15.4	6.95	51.2	26.63	65.3	7.25	36.5	45.58	74.2	45.23	57.6
25.4	6.86	52.1	26.46	67.2	7.18	37.7	45.13	76.8	45.11	59.2
Dec. 5.3	6.75	52.7	26.26	68.6	7.09	38.9	44.59	79.0	44.96	60.4
15.3	6.63	52.9	26.02	69.6	6.99	39.9	43.98	80.6	44.78	61.1
25.3	6.49	52.8	25.75	70.1	6.88	40.7	43.31	81.6	44.58	61.4
35.3	6.34	52.3	25.47	70.0	6.76	41.3	42.60	82.1	44.37	61.3



# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Piscium.		$\gamma$ Cassiopeiz.		$\mu$ Andromedæ.		43 Cephei (H.).		$\epsilon$ Piscium.											
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.										
	h m 0 43	+ 7 5	h m 0 51	+60 13	h m 0 51	+38 0	h m 0 55	+85 46	h m 0 58	+ 7 24										
	s	"	s	"	s	"	s	"	s	"										
Jan. 0.3	59.78	.11	39.4	0.6	14.78	.34	58.3	0.1	44.17	.17	47.2	0.5	72.63	2.90	44.4	0.5	15.42	.11	17.0	0.6
10.2	59.67	.11	38.8	0.7	14.44	.34	58.2	0.6	44.00	.17	46.7	0.5	69.73	2.91	44.9	0.5	15.31	.12	16.4	0.6
20.2	59.56	.10	38.1	0.7	14.10	.33	57.6	1.2	43.83	.17	45.9	0.8	66.82	2.83	44.8	0.7	15.19	.11	15.7	0.7
30.2	59.46	.10	37.4	0.6	13.77	.30	56.4	1.5	43.66	.16	44.8	1.4	63.99	2.63	44.1	1.4	15.08	.11	15.1	0.6
Feb. 9.2	59.36	.09	36.8	0.6	13.47	.27	54.9	2.0	43.50	.14	43.4	1.6	61.36	2.32	42.7	1.9	14.97	.09	14.5	0.6
19.1	59.27	.06	36.2	0.4	13.20	.22	52.9	2.3	43.36	.11	41.8	1.7	59.04	1.93	40.8	2.3	14.88	.07	13.9	0.4
Mar. 1.1	59.21	.03	35.8	0.3	12.98	.15	50.6	2.5	43.25	.07	40.1	1.8	57.11	1.47	38.5	2.7	14.81	.05	13.5	0.3
11.1	59.18	.00	35.5	0.1	12.83	.08	48.1	2.6	43.18	.02	38.3	1.7	55.64	0.94	35.8	3.0	14.76	.01	13.2	0.2
21.0	59.18	.04	35.4	0.1	12.75	.00	45.5	2.5	43.16	.02	36.6	1.6	54.70	0.40	32.8	3.0	14.75	.02	13.0	0.1
31.0	59.22	.08	35.5	0.3	12.75	.09	43.0	2.4	43.18	.08	35.0	1.5	54.30	0.17	29.8	3.0	14.77	.06	13.1	0.4
Apr. 10.0	59.30	.12	35.8	0.6	12.84	.17	40.6	2.2	43.26	.13	33.5	1.2	54.47	0.72	26.8	2.9	14.83	.11	13.5	0.5
20.0	59.42	.16	36.4	0.9	13.01	.26	38.4	1.9	43.39	.19	32.3	0.8	55.19	1.24	23.9	2.7	14.94	.15	14.0	0.9
29.9	59.58	.20	37.3	1.1	13.27	.33	36.5	1.5	43.58	.23	31.5	0.5	56.43	1.71	21.2	2.3	15.09	.19	14.9	1.1
May 9.9	59.78	.24	38.4	1.4	13.60	.39	35.0	1.1	43.81	.28	31.0	0.1	58.14	2.11	18.9	1.9	15.28	.23	16.0	1.3
19.9	60.02	.27	39.8	1.6	13.99	.45	33.9	0.6	44.09	.31	30.9	0.3	60.25	2.44	17.0	1.4	15.51	.26	17.3	1.6
29.9	60.29	.30	41.4	1.8	14.44	.49	33.3	0.1	44.40	.35	31.2	0.7	62.69	2.69	15.6	0.9	15.77	.29	18.9	1.7
June 8.8	60.59	.31	43.2	1.9	14.93	.52	33.2	0.5	44.75	.37	31.9	1.1	65.38	2.87	14.7	0.9	16.06	.30	20.6	1.9
18.8	60.90	.32	45.1	2.0	15.45	.54	33.7	0.9	45.12	.38	33.0	1.4	68.25	2.96	14.3	0.2	16.36	.32	22.5	2.0
28.8	61.22	.32	47.1	2.1	15.99	.53	34.6	1.4	45.50	.38	34.4	1.8	71.21	2.97	14.5	0.8	16.68	.33	24.5	2.0
July 8.7	61.54	.32	49.2	2.0	16.52	.52	36.0	1.8	45.88	.36	36.2	2.0	74.18	2.91	15.3	1.2	17.01	.31	26.5	2.1
18.7	61.86	.30	51.2	2.0	17.04	.49	37.8	2.2	46.24	.35	38.2	2.3	77.09	2.78	16.5	1.8	17.32	.30	28.6	1.9
28.7	62.16	.27	53.2	1.9	17.53	.46	40.0	2.6	46.59	.33	40.5	2.4	79.87	2.59	18.3	2.3	17.62	.29	30.5	1.9
Aug. 7.7	62.43	.25	55.1	1.7	17.99	.42	42.6	2.8	46.92	.29	42.9	2.6	82.46	2.34	20.6	2.7	17.91	.26	32.4	1.7
17.6	62.68	.22	56.8	1.6	18.41	.36	45.4	3.1	47.21	.26	45.5	2.6	84.80	2.05	23.3	3.0	18.17	.23	34.1	1.6
27.6	62.90	.18	58.4	1.3	18.77	.30	48.5	3.2	47.47	.22	48.1	2.7	86.85	1.72	26.3	3.4	18.40	.19	35.7	1.3
Sept. 6.6	63.08	.15	59.7	1.1	19.07	.25	51.7	3.3	47.69	.18	50.8	2.6	88.57	1.34	29.7	3.6	18.59	.17	37.0	1.1
16.5	63.23	.12	60.8	0.9	19.32	.18	55.0	3.4	47.87	.14	53.4	2.5	89.91	0.94	33.3	3.7	18.76	.13	38.1	0.9
26.5	63.35	.08	61.7	0.6	19.50	.12	58.4	3.3	48.01	.10	55.9	2.4	90.85	0.52	37.0	3.9	18.89	.09	39.0	0.7
Oct. 6.5	63.43	.05	62.3	0.5	19.62	.05	61.7	3.3	48.11	.06	58.3	2.2	91.37	0.08	40.9	3.9	18.98	.06	39.7	0.4
16.5	63.48	.01	62.8	0.2	19.67	.01	65.0	3.0	48.17	.02	60.5	2.1	91.45	0.38	44.8	3.8	19.04	.04	40.1	0.3
26.5	63.49	.01	63.0	0.0	19.66	.06	68.0	2.9	48.19	.02	62.6	1.8	91.07	0.82	48.6	3.6	19.08	.00	40.4	0.0
Nov. 5.4	63.48	.03	63.0	0.1	19.60	.12	70.9	2.5	48.17	.04	64.4	1.5	90.25	1.26	52.2	3.4	19.08	.02	40.4	0.1
15.4	63.45	.05	62.9	0.3	19.48	.18	73.4	2.2	48.13	.08	65.9	1.2	88.99	1.68	55.6	3.1	19.06	.05	40.3	0.2
25.4	63.40	.07	62.6	0.3	19.30	.22	75.6	1.8	48.05	.10	67.1	0.9	87.31	2.06	58.7	2.6	19.01	.06	40.1	0.4
Dec. 5.3	63.33	.09	62.3	0.5	19.08	.26	77.4	1.3	47.95	.13	68.0	0.5	85.25	2.39	61.3	2.2	18.95	.08	39.7	0.5
15.3	63.24	.10	61.8	0.6	18.82	.30	78.7	0.8	47.82	.14	68.5	0.2	82.86	2.64	63.5	1.5	18.87	.09	39.2	0.5
25.3	63.14	.10	61.2	0.6	18.52	.32	79.5	0.2	47.68	.16	68.7	0.2	80.22	2.82	65.0	1.0	18.78	.11	38.7	0.6
35.3	63.04		60.6		18.20		79.7		47.52		68.5		77.40		66.0		18.67		38.1	

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Andromedæ.			$\kappa$ Tucanæ.			$f$ Piscium.			$\theta^{\alpha}$ Ceti.			38 Cassiopeizæ.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h m 1 4	° +35 8		h m 1 12	° -69 20		h m 1 13	° + 3 8		h m 1 19	° - 8 38		h m 1 24	° +69 47	
Jan. 0.3	40.36	.16	42.6	43.61	.53	99.2	8.61	.11	21.7	.07	30.84	.11	60.0	.51	80.4
10.2	40.20	.16	42.2	43.08	.52	99.1	8.50	.11	21.0	.06	30.73	.12	60.7	.53	80.9
20.2	40.04	.16	41.5	42.56	.50	98.3	8.39	.12	20.4	.05	30.61	.12	61.2	.54	80.9
30.2	39.88	.16	40.5	42.06	.46	97.0	8.27	.11	19.9	.05	30.49	.11	61.5	.51	80.3
Feb. 9.2	39.72	.14	39.3	41.60	.42	95.1	8.16	.10	19.4	.03	30.38	.11	61.6	.47	79.1
19.1	39.58	.11	37.9	41.18	.35	92.7	8.06	.08	19.1	.03	30.27	.09	61.5	.41	77.5
Mar. 1.1	39.47	.08	36.3	40.83	.28	89.9	7.98	.06	18.8	.00	30.18	.06	61.2	.32	75.4
11.1	39.39	.03	34.7	40.55	.19	86.8	7.92	.03	18.8	.01	30.12	.04	60.7	.22	73.0
21.0	39.36	.01	33.1	40.36	.11	83.3	7.89	.01	18.9	.03	30.08	.00	59.9	.11	70.4
31.0	39.37	.06	31.6	40.25	.01	79.7	7.90	.05	19.2	.06	30.08	.04	58.9	.01	67.7
Apr. 10.0	39.43	.11	30.3	40.24	.09	75.9	7.95	.09	19.8	.08	30.12	.08	57.6	.14	65.0
20.0	39.54	.17	29.3	40.33	.20	72.1	8.04	.13	20.6	.11	30.20	.13	56.1	.25	62.4
29.9	39.71	.22	28.5	40.53	.29	68.3	8.17	.18	21.7	.13	30.33	.16	54.4	.37	60.0
May 9.9	39.93	.26	28.1	40.82	.38	64.6	8.35	.21	23.0	.15	30.49	.21	52.5	.47	57.9
19.9	40.19	.30	28.0	41.20	.47	61.1	8.56	.25	24.5	.17	30.70	.24	50.4	.56	56.2
29.9	40.49	.33	28.4	41.67	.54	57.9	8.81	.28	26.2	.19	30.94	.28	48.3	.63	54.9
June 8.8	40.82	.35	29.1	42.21	.61	55.0	9.09	.30	28.1	.19	31.22	.29	46.1	.69	54.1
18.8	41.17	.37	30.1	42.82	.65	52.5	9.39	.31	30.0	.20	31.51	.31	43.8	.72	53.8
28.8	41.54	.37	31.5	43.47	.68	50.5	9.70	.32	32.0	.21	31.82	.32	41.6	.73	54.1
July 8.8	41.91	.36	33.2	44.15	.70	49.0	10.02	.32	34.1	.20	32.14	.32	39.5	.73	54.8
18.7	42.27	.35	35.2	44.85	.69	48.1	10.34	.31	36.1	.19	32.46	.31	37.6	.71	56.1
28.7	42.62	.33	37.4	45.54	.66	47.8	10.65	.29	38.0	.17	32.77	.29	35.9	.67	57.8
Aug. 7.7	42.95	.29	39.7	46.20	.62	48.0	10.94	.26	39.7	.16	33.06	.28	34.4	.62	59.9
17.6	43.24	.27	42.1	46.82	.55	48.8	11.20	.24	41.3	.14	33.34	.24	33.2	.57	62.4
27.6	43.51	.23	44.6	47.37	.47	50.2	11.44	.21	42.7	.11	33.58	.22	32.3	.50	65.2
Sept. 6.6	43.74	.19	47.1	47.84	.38	52.0	11.65	.18	43.8	.09	33.80	.18	31.7	.41	68.3
16.6	43.93	.15	49.5	48.22	.27	54.3	11.83	.14	44.7	.06	33.98	.15	31.5	.34	71.6
26.5	44.08	.12	51.9	48.49	.17	56.9	11.97	.11	45.3	.04	34.13	.11	31.5	.25	75.0
Oct. 6.5	44.20	.07	54.1	48.66	.06	59.8	12.08	.08	45.7	.02	34.24	.08	31.8	.16	78.6
16.5	44.27	.04	56.2	48.72	.06	62.8	12.16	.04	45.9	.00	34.32	.05	32.3	.07	82.1
26.5	44.31	.01	58.1	48.66	.16	65.8	12.20	.02	45.9	.02	34.37	.02	33.1	.02	85.5
Nov. 5.4	44.32	.03	59.7	48.50	.25	68.7	12.22	.01	45.7	.04	34.39	.01	34.0	.12	88.8
15.4	44.29	.06	61.1	48.25	.34	71.4	12.21	.03	45.3	.04	34.38	.03	35.0	.20	91.9
25.4	44.23	.09	62.2	47.91	.41	73.7	12.18	.06	44.9	.06	34.35	.06	36.0	.28	94.7
Dec. 5.3	44.14	.11	63.1	47.50	.47	75.6	12.12	.07	44.3	.06	34.29	.07	37.0	.36	97.1
15.3	44.03	.13	63.6	47.03	.50	77.0	12.05	.09	43.7	.06	34.22	.09	38.0	.43	99.1
25.3	43.90	.14	63.7	46.53	.52	77.8	11.96	.10	43.1	.06	34.13	.11	38.8	.48	100.5
35.3	43.76		63.6	46.01		78.0	11.86		42.5		34.02		39.6		101.4

# FIXED STARS, 1910.

329

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Piscium.		$\nu$ Andromedæ.		$\pi$ Piscium.		$\alpha$ Eridani. (Achernar.)		$\nu$ Piscium.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 1 26	° +14 52	h m 1 31	° +40 57	h m 1 32	° +11 40	h m 1 34	° -57 41	h m 1 36	° + 5 1
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 0.3	39.18	55.1	29.77	27.9	18.85	51.4	22.09	59.6	44.18	53.2
10.3	39.07	54.6	29.60	27.9	18.74	50.9	21.77	59.9	44.07	52.6
20.2	38.95	54.0	29.41	27.4	18.62	50.3	21.45	59.7	43.95	52.0
30.2	38.82	53.3	29.22	26.7	18.49	49.7	21.14	59.0	43.83	51.4
Feb. 9.2	38.69	52.6	29.03	25.6	18.37	49.1	20.83	57.7	43.71	50.9
19.2	38.58	51.8	28.85	24.3	18.25	48.5	20.55	55.9	43.59	50.6
Mar. 1.1	38.48	51.1	28.70	22.7	18.15	47.9	20.31	53.6	43.49	50.3
11.1	38.40	50.5	28.58	21.0	18.07	47.4	20.11	51.0	43.41	50.1
21.1	38.36	50.0	28.51	19.3	18.03	47.1	19.96	48.0	43.36	50.2
31.1	38.35	49.6	28.48	17.6	18.02	46.9	19.87	44.7	43.35	50.4
Apr. 10.0	38.39	49.5	28.51	16.0	18.05	47.0	19.84	41.2	43.37	50.8
20.0	38.47	49.6	28.60	14.6	18.12	47.3	19.88	37.6	43.44	51.5
30.0	38.60	50.0	28.74	13.4	18.24	47.8	19.99	33.9	43.55	52.4
May 9.9	38.77	50.6	28.86	12.5	18.40	48.6	20.17	30.3	43.71	53.6
19.9	38.98	51.5	29.19	12.0	18.61	49.6	20.42	26.8	43.91	55.0
29.9	39.23	52.6	29.49	11.9	18.85	50.9	20.73	23.4	44.14	56.5
June 8.9	39.51	54.0	29.82	12.2	19.12	52.4	21.10	20.3	44.41	58.2
18.8	39.82	55.6	30.19	12.8	19.42	54.1	21.52	17.5	44.70	60.1
28.8	40.14	57.3	30.57	13.8	19.74	55.9	21.97	15.1	45.01	62.1
July 8.8	40.46	59.2	30.96	15.2	20.06	57.8	22.45	13.2	45.32	64.0
18.7	40.79	61.1	31.35	16.8	20.38	59.7	22.94	11.8	45.64	66.0
28.7	41.11	63.1	31.73	18.7	20.70	61.7	23.43	10.9	45.95	67.9
Aug. 7.7	41.41	65.1	32.09	20.9	21.00	63.6	23.90	10.6	46.25	69.7
17.7	41.69	67.0	32.43	23.2	21.28	65.3	24.34	10.9	46.53	71.3
27.6	41.94	68.8	32.74	25.6	21.53	67.0	24.75	11.7	46.78	72.7
Sept. 6.6	42.17	70.4	33.01	28.1	21.76	68.5	25.11	13.0	47.01	73.9
16.6	42.36	71.8	33.24	30.6	21.95	69.8	25.41	14.9	47.21	74.9
26.6	42.52	73.1	33.44	33.1	22.12	70.8	25.65	17.1	47.38	75.6
Oct. 6.5	42.64	74.1	33.60	35.6	22.25	71.7	25.82	19.6	47.51	76.1
16.5	42.74	75.0	33.71	37.9	22.35	72.4	25.92	22.4	47.61	76.3
26.5	42.80	75.7	33.78	40.1	22.41	72.9	25.94	25.3	47.68	76.4
Nov. 5.4	42.83	76.2	33.82	42.1	22.45	73.2	25.90	28.2	47.72	76.3
15.4	42.84	76.5	33.82	43.9	22.46	73.3	25.80	30.9	47.73	76.0
25.4	42.82	76.6	33.78	45.4	22.45	73.3	25.64	33.4	47.72	75.6
Dec. 5.4	42.77	76.6	33.71	46.6	22.41	73.1	25.43	35.6	47.68	75.1
15.3	42.70	76.4	33.60	47.5	22.35	72.8	25.18	37.3	47.62	74.6
25.3	42.62	76.1	33.47	48.0	22.26	72.4	24.90	38.5	47.54	74.1
35.3	42.52	75.7	33.32	48.2	22.16	71.9	24.60	39.2	47.45	73.5

**CIRCUMPOLAR STARS.**

**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '	Nov.	h m	° '
	1 27	+88 49		6 59	+87 11		12 14	+88 11		18 0	+86 36		19 9	+89 0
	s	"		s	"		s	"		s	"		s	"
1.4	52.25	52.6	1.7	9.21	17.6	1.9	6.67	32.6	1.1	52.79	59.8	1.2	42.71	37.2
2.4	52.19	53.0	2.7	9.70	17.6	2.9	6.97	32.3	2.1	52.43	59.6	2.2	41.36	37.2
3.4	52.12	53.4	3.7	10.21	17.7	3.9	7.28	31.9	3.1	52.06	59.4	3.2	39.95	37.1
4.4	52.01	53.8	4.7	10.75	17.8	4.9	7.64	31.5	4.1	51.68	59.3	4.2	38.49	37.1
5.4	51.84	54.2	5.7	11.29	17.9	5.9	8.05	31.1	5.1	51.28	59.1	5.2	36.99	37.0
6.4	51.61	54.6	6.7	11.83	18.0	6.9	8.50	30.8	6.1	50.90	58.9	6.2	35.46	36.9
7.4	51.30	55.0	7.7	12.37	18.2	7.9	8.99	30.4	7.1	50.53	58.6	7.2	33.92	36.8
8.4	50.93	55.4	8.7	12.89	18.3	8.9	9.51	30.1	8.1	50.17	58.4	8.2	32.43	36.6
9.4	50.51	55.8	9.7	13.38	18.5	9.9	10.03	29.8	9.1	49.82	58.1	9.2	31.00	36.5
10.4	50.06	56.1	10.7	13.85	18.7	10.9	10.55	29.5	10.1	49.50	57.8	10.2	29.63	36.3
11.4	49.63	56.5	11.6	14.30	18.9	11.9	11.06	29.2	11.1	49.20	57.6	11.2	28.32	36.1
12.4	49.23	56.8	12.6	14.74	19.0	12.9	11.53	28.9	12.1	48.92	57.3	12.2	27.07	36.0
13.4	48.87	57.1	13.6	15.17	19.2	13.9	11.97	28.6	13.1	48.63	57.1	13.2	25.86	35.8
14.4	48.54	57.4	14.6	15.61	19.3	14.9	12.39	28.4	14.1	48.34	56.8	14.2	24.64	35.7
15.4	48.25	57.8	15.6	16.06	19.4	15.9	12.81	28.1	15.1	48.04	56.6	15.2	23.40	35.5
16.4	47.98	58.1	16.6	16.53	19.6	16.9	13.24	27.8	16.1	47.72	56.4	16.2	22.13	35.4
17.4	47.68	58.5	17.6	17.01	19.7	17.9	13.70	27.5	17.1	47.40	56.2	17.1	20.80	35.3
18.4	47.33	58.8	18.6	17.50	19.8	18.9	14.19	27.2	18.1	47.06	56.0	18.1	19.42	35.2
19.4	46.92	59.2	19.6	18.01	20.0	19.8	14.72	26.9	19.1	46.72	55.7	19.1	18.01	35.0
20.4	46.44	59.6	20.6	18.51	20.2	20.8	15.31	26.6	20.1	46.39	55.4	20.1	16.59	34.8
21.4	45.89	60.0	21.6	18.99	20.4	21.8	15.93	26.3	21.1	46.07	55.1	21.1	15.20	34.6
22.4	45.28	60.3	22.6	19.45	20.7	22.8	16.57	26.0	22.1	45.77	54.8	22.1	13.86	34.4
23.4	44.62	60.7	23.6	19.88	20.9	23.8	17.21	25.7	23.1	45.50	54.5	23.1	12.59	34.2
24.4	43.96	61.0	24.6	20.28	21.1	24.8	17.84	25.5	24.1	45.26	54.2	24.1	11.42	34.0
25.4	43.31	61.3	25.6	20.65	21.4	25.8	18.45	25.3	25.1	45.04	53.9	25.1	10.33	33.7
26.4	42.68	61.6	26.6	21.01	21.6	26.8	19.02	25.1	26.1	44.83	53.6	26.1	9.28	33.5
27.4	42.11	61.8	27.6	21.37	21.8	27.8	19.57	24.8	27.1	44.63	53.3	27.1	8.27	33.3
28.4	41.56	62.1	28.6	21.73	22.0	28.8	20.10	24.6	28.1	44.42	53.0	28.1	7.27	33.1
29.4	41.04	62.4	29.6	22.10	22.2	29.8	20.62	24.4	29.1	44.20	52.7	29.1	6.26	32.9
30.4	40.52	62.7	30.6	22.49	22.3	30.8	21.15	24.1	30.1	43.97	52.5	30.1	5.20	32.7
31.4	39.98	63.0	31.6	22.88	22.5	31.8	21.71	23.8	31.1	43.73	52.2	31.1	4.10	32.5

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Dec.	h m 1 27	° ' +88 50	Dec.	h m 6 59	° ' +87 11	Dec.	h m 12 14	° ' +88 11	Dec.	h m 18 0	° ' +86 36	Dec.	h m 19 8	° ' +89 0
	s	"		s	"		s	"		s	"		s	"
1.4	39.98	3.0	1.6	22.88	22.5	1.8	21.71	23.8	1.1	43.73	52.2	1.1	64.10	32.5
2.4	39.39	3.3	2.6	23.29	22.8	2.8	22.32	23.6	2.1	43.49	51.9	2.1	62.95	32.3
3.4	38.74	3.6	3.6	23.71	23.0	3.8	22.97	23.3	3.0	43.25	51.6	3.1	61.78	32.1
4.4	38.02	4.0	4.6	24.12	23.3	4.8	23.66	23.1	4.0	43.01	51.3	4.1	60.62	31.9
5.4	37.22	4.3	5.6	24.51	23.5	5.8	24.39	22.9	5.0	42.79	50.9	5.1	59.49	31.6
6.4	36.38	4.6	6.6	24.87	23.8	6.8	25.13	22.7	6.0	42.59	50.6	6.1	58.42	31.3
7.3	35.51	4.8	7.6	25.20	24.1	7.8	25.86	22.5	7.0	42.42	50.2	7.1	57.42	31.0
8.3	34.64	5.1	8.6	25.52	24.4	8.8	26.58	22.4	8.0	42.27	49.8	8.1	56.50	30.7
9.3	33.80	5.3	9.6	25.81	24.7	9.8	27.26	22.2	9.0	42.13	49.5	9.1	55.64	30.4
10.3	33.00	5.6	10.6	26.09	25.0	10.8	27.90	22.1	10.0	42.00	49.2	10.1	54.83	30.2
11.3	32.24	5.8	11.6	26.37	25.2	11.8	28.52	21.9	11.0	41.87	48.9	11.1	54.05	29.9
12.3	31.52	6.0	12.6	26.66	25.5	12.8	29.12	21.8	12.0	41.74	48.6	12.1	53.28	29.6
13.3	30.82	6.2	13.6	26.95	25.7	13.8	29.72	21.6	13.0	41.60	48.3	13.1	52.48	29.4
14.3	30.13	6.5	14.6	27.26	25.9	14.8	30.34	21.5	14.0	41.44	48.0	14.1	51.63	29.2
15.3	29.41	6.8	15.6	27.60	26.2	15.8	30.99	21.3	15.0	41.28	47.7	15.1	50.73	28.9
16.3	28.63	7.0	16.6	27.93	26.4	16.8	31.67	21.1	16.0	41.11	47.3	16.1	49.80	28.7
17.3	27.78	7.3	17.6	28.25	26.7	17.8	32.40	21.0	17.0	40.95	47.0	17.1	48.86	28.4
18.3	26.86	7.5	18.6	28.56	27.0	18.8	33.17	20.8	18.0	40.80	46.6	18.1	47.95	28.1
19.3	25.89	7.8	19.5	28.85	27.4	19.8	33.96	20.7	19.0	40.67	46.3	19.1	47.09	27.8
20.3	24.87	8.0	20.5	29.12	27.7	20.8	34.75	20.6	20.0	40.56	45.9	20.1	46.30	27.5
21.3	23.83	8.2	21.5	29.34	28.0	21.8	35.53	20.5	21.0	40.48	45.5	21.0	45.60	27.1
22.3	22.81	8.4	22.5	29.53	28.4	22.8	36.29	20.4	22.0	40.43	45.1	22.0	44.99	26.8
23.3	21.82	8.5	23.5	29.70	28.7	23.8	37.01	20.4	22.9	40.40	44.8	23.0	44.46	26.4
24.3	20.85	8.7	24.5	29.87	29.0	24.8	37.70	20.3	23.9	40.38	44.4	24.0	43.98	26.1
25.3	19.93	8.8	25.5	30.03	29.3	25.7	38.36	20.2	24.9	40.36	44.1	25.0	43.53	25.8
26.3	19.05	9.0	26.5	30.20	29.5	26.7	39.00	20.2	25.9	40.34	43.8	26.0	43.08	25.5
27.3	18.20	9.1	27.5	30.38	29.8	27.7	39.64	20.1	26.9	40.30	43.5	27.0	42.60	25.3
28.3	17.34	9.3	28.5	30.57	30.1	28.7	40.29	20.0	27.9	40.25	43.2	28.0	42.09	25.0
29.3	16.45	9.4	29.5	30.77	30.4	29.7	40.98	19.9	28.9	40.20	42.8	29.0	41.53	24.7
30.3	15.51	9.6	30.5	30.97	30.7	30.7	41.71	19.8	29.9	40.14	42.5	30.0	40.95	24.4
31.3	14.51	9.8	31.5	31.17	31.0	31.7	42.48	19.7	30.9	40.10	42.2	31.0	40.37	24.1
32.3	13.44	10.0	32.5	31.35	31.3	32.7	43.27	19.7	31.9	40.06	41.8	32.0	39.82	23.8

## FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Piscium.		α Andromedæ.		β Cassiopeizæ.		22 Andromedæ.		γ Pegasi. (Algenib.)	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 0 0	° ' " - 6 12	h m 0 3	° ' " + 28 35	h m 0 4	° ' " + 58 38	h m 0 5	° ' " + 45 34	h m 0 8	° ' " + 14 40
Jan. 0.2	42.64	49.3	42.70	39.3	20.48	82.8	36.93	24.7	34.83	57.6
10.2	42.54	49.8	42.57	38.4	20.16	82.1	36.73	23.9	34.72	56.8
20.2	42.45	50.3	42.44	37.3	19.86	80.9	36.53	22.6	34.61	55.9
30.2	42.37	50.6	42.32	35.9	19.58	79.2	36.35	21.0	34.51	54.9
Feb. 9.1	42.30	50.7	42.22	34.4	19.34	77.1	36.20	19.1	34.43	53.9
19.1	42.26	50.7	42.14	32.8	19.15	74.7	36.08	17.0	34.37	52.9
Mar. 1.1	42.24	50.5	42.10	31.2	19.01	72.1	36.00	14.8	34.34	52.0
11.0	42.25	50.0	42.09	29.7	18.95	69.4	35.97	12.5	34.33	51.2
21.0	42.29	49.3	42.13	28.3	18.96	66.8	35.99	10.3	34.37	50.6
31.0	42.37	48.4	42.21	27.1	19.05	64.2	36.07	8.3	34.44	50.3
Apr. 10.0	42.49	47.3	42.33	26.2	19.22	61.9	36.21	6.6	34.56	50.2
19.9	42.65	45.9	42.50	25.7	19.46	60.0	36.40	5.2	34.71	50.4
29.9	42.85	44.3	42.72	25.5	19.78	58.5	36.65	4.2	34.91	50.9
May 9.9	43.09	42.5	42.98	25.7	20.16	57.4	36.95	3.6	35.15	51.8
19.9	43.35	40.5	43.27	26.3	20.59	56.8	37.30	3.5	35.42	52.9
29.8	43.64	38.5	43.58	27.3	21.06	56.7	37.67	3.9	35.71	54.3
June 8.8	43.95	36.4	43.92	28.6	21.55	57.2	38.06	4.8	36.02	56.0
18.8	44.27	34.3	44.27	30.3	22.06	58.2	38.46	6.1	36.34	57.9
28.7	44.59	32.2	44.62	32.3	22.57	59.7	38.87	7.8	36.67	60.0
July 8.7	44.91	30.2	44.96	34.4	23.06	61.6	39.27	9.9	36.99	62.1
18.7	45.21	28.4	45.28	36.8	23.52	64.0	39.64	12.3	37.30	64.3
28.7	45.49	26.8	45.58	39.3	23.95	66.7	39.99	14.9	37.59	66.5
Aug. 7.6	45.75	25.4	45.85	41.8	24.33	69.7	40.30	17.8	37.85	68.7
17.6	45.97	24.2	46.08	44.4	24.66	72.9	40.56	20.8	38.07	70.7
27.6	46.16	23.3	46.27	46.9	24.93	76.2	40.78	23.9	38.26	72.6
Sept. 6.6	46.31	22.7	46.43	49.3	25.13	79.6	40.96	26.9	38.42	74.4
16.5	46.42	22.4	46.54	51.6	25.27	83.1	41.08	29.9	38.53	75.9
26.5	46.49	22.3	46.61	53.7	25.35	86.5	41.16	32.9	38.61	77.2
Oct. 6.5	46.52	22.5	46.65	55.6	25.37	89.8	41.19	35.7	38.65	78.3
16.5	46.52	22.8	46.65	57.3	25.33	92.9	41.17	38.2	38.66	79.2
26.4	46.50	23.3	46.61	58.7	25.23	95.7	41.12	40.5	38.64	79.9
Nov. 5.4	46.45	23.9	46.55	59.8	25.08	98.2	41.03	42.5	38.60	80.3
15.4	46.38	24.6	46.47	60.7	24.89	100.4	40.91	44.1	38.53	80.5
25.3	46.29	25.4	46.37	61.2	24.65	102.1	40.76	45.3	38.45	80.6
Dec. 5.3	46.20	26.1	46.25	61.4	24.38	103.3	40.59	46.1	38.36	80.4
15.3	46.10	26.8	46.13	61.3	24.09	104.0	40.40	46.5	38.25	80.0
25.3	46.00	27.5	45.99	60.9	23.79	104.2	40.20	46.4	38.14	79.4
35.2	45.90	28.1	45.86	60.2	23.47	103.8	40.00	45.9	38.03	78.7

# FIXED STARS, 1910.

325

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Andromedæ.		ε Ceti.		44 Piscium.		β Hydri.		ι Ceti.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 0 13	° ' " +36 16	h m 0 14	° ' " - 9 19	h m 0 20	° ' " + 1 26	h m 0 20	° ' " -77 45	h m 0 25	° ' " - 4 26
Jan. 0.2	36.09	75.7	49.55	32.5	46.29	22.0	62.06	66.0	25.79	84.7
10.2	35.93	74.8	49.44	33.0	46.18	21.4	61.19	64.9	25.68	85.3
20.2	35.77	73.7	49.34	33.3	46.08	20.8	60.38	63.2	25.58	85.8
30.2	35.62	72.3	49.25	33.5	45.99	20.2	59.65	61.0	25.49	86.1
Feb. 9.1	35.49	70.7	49.17	33.5	45.91	19.7	59.02	58.3	25.40	86.3
19.1	35.39	68.9	49.12	33.3	45.85	19.4	58.51	55.2	25.34	86.4
Mar. 1.1	35.33	67.0	49.08	32.9	45.81	19.2	58.14	51.8	25.29	86.3
11.1	35.30	65.1	49.08	32.3	45.80	19.2	57.90	48.2	25.28	85.9
21.0	35.32	63.4	49.11	31.4	45.82	19.4	57.82	44.4	25.30	85.3
31.0	35.39	61.8	49.18	30.3	45.88	19.9	57.89	40.5	25.36	84.5
Apr. 10.0	35.51	60.5	49.28	29.0	45.98	20.6	58.12	36.6	25.45	83.5
19.9	35.68	59.5	49.43	27.4	46.12	21.5	58.50	32.8	25.59	82.2
29.9	35.90	58.9	49.62	25.7	46.30	22.7	59.04	29.2	25.76	80.7
May 9.9	36.16	58.7	49.84	23.8	46.52	24.2	59.72	25.9	25.98	79.0
19.9	36.47	58.9	50.10	21.7	46.78	25.8	60.52	22.8	26.23	77.1
29.8	36.80	59.6	50.38	19.6	47.06	27.7	61.43	20.1	26.50	75.1
June 8.8	37.15	60.6	50.69	17.4	47.36	29.6	62.44	17.9	26.80	73.0
18.8	37.52	62.1	51.01	15.2	47.67	31.7	63.51	16.2	27.12	70.8
28.8	37.89	63.9	51.33	13.1	47.99	33.8	64.62	15.0	27.44	68.7
July 8.7	38.25	66.0	51.65	11.2	48.31	35.8	65.74	14.4	27.76	66.7
18.7	38.59	68.3	51.96	9.4	48.62	37.8	66.85	14.3	28.07	64.8
28.7	38.91	70.8	52.25	7.8	48.91	39.7	67.91	14.8	28.36	63.1
Aug. 7.6	39.20	73.5	52.52	6.5	49.17	41.4	68.89	15.9	28.63	61.6
17.6	39.46	76.2	52.75	5.5	49.40	42.9	69.76	17.5	28.87	60.3
27.6	39.67	79.0	52.95	4.7	49.60	44.2	70.50	19.5	29.07	59.3
Sept. 6.6	39.84	81.7	53.11	4.3	49.77	45.3	71.08	22.0	29.24	58.6
16.5	39.97	84.3	53.23	4.1	49.90	46.1	71.49	24.7	29.38	58.1
26.5	40.06	86.8	53.32	4.2	49.99	46.6	71.72	27.6	29.47	57.9
Oct. 6.5	40.10	89.1	53.37	4.6	50.04	46.9	71.75	30.7	29.53	58.0
16.5	40.11	91.2	53.39	5.1	50.07	47.0	71.60	33.7	29.56	58.2
26.4	40.08	93.1	53.37	5.8	50.06	46.9	71.26	36.5	29.56	58.7
Nov. 5.4	40.02	94.7	53.33	6.6	50.03	46.7	70.77	39.0	29.53	59.2
15.4	39.93	96.0	53.27	7.4	49.98	46.3	70.13	41.2	29.48	59.9
25.3	39.82	96.9	53.19	8.3	49.91	45.8	69.38	42.9	29.41	60.6
Dec. 5.3	39.69	97.4	53.10	9.1	49.82	45.2	68.55	44.0	29.32	61.4
15.3	39.55	97.6	53.00	9.9	49.73	44.6	67.67	44.6	29.23	62.1
25.3	39.40	97.4	52.90	10.6	49.63	43.9	66.76	44.5	29.13	62.8
35.2	39.24	96.8	52.79	11.2	49.52	43.3	65.87	43.8	29.03	63.4

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\pi$ Andromedæ.		$\alpha$ Cassiopeizæ.		$\beta$ Ceti.		$\gamma$ Cassiopeizæ.		$\delta$ Cassiopeizæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m ° 32	° ' +33 13	h m ° 35	° ' +56 2	h m ° 39	° ' -18 28	h m ° 39	° ' +74 29	h m ° 39	° ' +47 47
	s	"	s	"	s	"	s	"	s	"
Jan. 0.3	3.10 .15	31.0 .6	22.22 .29	48.7 .4	3.54 .12	62.6 .4	39.31 .73	60.5 .1	41.09 .23	39.9 .4
10.2	2.95 .15	30.4 .10	21.93 .29	48.3 .8	3.42 .11	63.0 .2	38.58 .72	60.6 .6	40.87 .22	39.5 .9
20.2	2.80 .15	29.4 .12	21.64 .27	47.5 .14	3.31 .11	63.2 .1	37.86 .69	60.0 .12	40.65 .21	38.6 .13
30.2	2.65 .13	28.2 .15	21.37 .25	46.1 .17	3.20 .10	63.1 .3	37.17 .63	58.8 .17	40.44 .19	37.3 .16
Feb. 9.1	2.52 .11	26.7 .16	21.12 .21	44.4 .21	3.10 .08	62.8 .6	36.54 .55	57.1 .21	40.25 .17	35.7 .19
19.1	2.41 .08	25.1 .16	20.91 .16	42.3 .23	3.02 .06	62.2 .9	35.99 .44	55.0 .25	40.08 .13	33.8 .1
Mar. 1.1	2.33 .04	23.5 .17	20.75 .11	40.0 .25	2.96 .03	61.3 .11	35.55 .30	52.5 .28	39.95 .08	31.7 .22
11.1	2.29 .00	21.8 .15	20.64 .04	37.5 .25	2.93 .01	60.2 .14	35.25 .16	49.7 .29	39.87 .02	29.5 .22
21.0	2.29 .05	20.3 .14	20.60 .04	35.0 .24	2.94 .04	58.8 .16	35.09 .01	46.8 .29	39.85 .03	27.3 .21
31.0	2.34 .10	18.9 .12	20.64 .11	32.6 .23	2.98 .08	57.2 .19	35.08 .14	43.9 .29	39.88 .10	25.2 .19
Apr. 10.0	2.44 .14	17.7 .09	20.75 .18	30.3 .20	3.06 .12	55.3 .21	35.22 .30	41.0 .26	39.98 .16	23.3 .16
20.0	2.58 .20	16.8 .05	20.93 .26	28.3 .16	3.18 .17	53.2 .22	35.52 .45	38.4 .23	40.14 .22	21.7 .13
29.9	2.78 .24	16.3 .02	21.19 .32	26.7 .12	3.35 .20	51.0 .23	35.97 .57	36.1 .19	40.36 .27	20.4 .9
May 9.9	3.02 .28	16.1 .02	21.51 .38	25.5 .08	3.55 .25	48.7 .24	36.54 .68	34.2 .14	40.63 .32	19.5 .05
19.9	3.30 .32	16.3 .07	21.89 .43	24.7 .03	3.80 .27	46.3 .25	37.22 .77	32.8 .10	40.95 .37	19.0 .00
29.8	3.62 .34	17.0 .10	22.32 .45	24.4 .03	4.07 .30	43.8 .24	37.99 .84	31.8 .04	41.32 .40	19.0 .05
June 8.8	3.96 .35	18.0 .14	22.77 .48	24.7 .07	4.37 .32	41.4 .23	38.83 .88	31.4 .02	41.72 .41	19.5 .09
18.8	4.31 .36	19.4 .17	23.25 .49	25.4 .12	4.69 .33	39.1 .21	39.71 .89	31.6 .07	42.13 .42	20.4 .13
28.8	4.67 .36	21.1 .20	23.74 .48	26.6 .16	5.02 .33	37.0 .20	40.60 .89	32.3 .12	42.55 .42	21.7 .18
July 8.7	5.03 .35	23.1 .22	24.22 .46	28.2 .21	5.35 .33	35.0 .17	41.49 .85	33.5 .17	42.97 .41	23.5 .21
18.7	5.38 .32	25.3 .23	24.68 .44	30.3 .24	5.68 .31	33.3 .14	42.34 .81	35.2 .22	43.38 .38	25.6 .24
28.7	5.70 .30	27.6 .25	25.12 .40	32.7 .27	5.99 .29	31.9 .10	43.15 .74	37.4 .26	43.76 .36	28.0 .26
Aug. 7.7	6.00 .27	30.1 .26	25.52 .35	35.4 .29	6.28 .25	30.9 .07	43.89 .66	40.0 .30	44.12 .31	30.6 .28
17.6	6.27 .23	32.7 .26	25.87 .31	38.3 .32	6.53 .23	30.2 .04	44.55 .57	43.0 .32	44.43 .28	33.4 .29
27.6	6.50 .19	35.3 .26	26.18 .25	41.5 .32	6.76 .19	29.8 .00	45.12 .46	46.2 .35	44.71 .23	36.3 .30
Sept. 6.6	6.69 .15	37.9 .24	26.43 .19	44.7 .33	6.95 .15	29.8 .03	45.58 .35	49.7 .36	44.94 .18	39.3 .30
16.5	6.84 .10	40.3 .24	26.62 .14	48.0 .33	7.10 .11	30.1 .06	45.93 .23	53.3 .37	45.12 .13	42.3 .30
26.5	6.94 .07	42.7 .21	26.76 .08	51.3 .32	7.21 .08	30.7 .09	46.16 .12	57.0 .38	45.25 .08	45.3 .29
Oct. 6.5	7.01 .04	44.8 .20	26.84 .03	54.5 .30	7.29 .03	31.6 .11	46.28 .00	60.8 .36	45.33 .04	48.2 .27
16.5	7.05 .00	46.8 .17	26.87 .03	57.5 .29	7.32 .01	32.7 .12	46.28 .12	64.4 .35	45.37 .01	50.9 .25
26.4	7.05 .04	48.5 .15	26.84 .08	60.4 .26	7.33 .03	33.9 .13	46.16 .24	67.9 .33	45.36 .04	53.4 .23
Nov. 5.4	7.01 .06	50.0 .12	26.76 .13	63.0 .23	7.30 .05	35.2 .13	45.92 .34	71.2 .30	45.32 .09	55.7 .19
15.4	6.95 .09	51.2 .09	26.63 .17	65.3 .19	7.25 .07	36.5 .12	45.58 .45	74.2 .26	45.23 .12	57.6 .16
25.4	6.86 .11	52.1 .06	26.46 .20	67.2 .14	7.18 .09	37.7 .12	45.13 .54	76.8 .22	45.11 .15	59.2 .12
Dec. 5.3	6.75 .12	52.7 .02	26.26 .24	68.6 .10	7.09 .10	38.9 .10	44.59 .61	79.0 .16	44.96 .18	60.4 .07
15.3	6.63 .14	52.9 .01	26.02 .27	69.6 .05	6.99 .11	39.9 .08	43.98 .67	80.6 .10	44.78 .20	61.1 .03
25.3	6.49 .15	52.8 .05	25.75 .28	70.1 .01	6.88 .12	40.7 .06	43.31 .71	81.6 .05	44.58 .21	61.4 .01
35.3	6.34 .14	52.3 .05	25.47 .28	70.0 .01	6.76 .12	41.3 .06	42.60 .71	82.1 .05	44.37 .21	61.3 .01



# FIXED STARS, 1910.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Piscium.		$\gamma$ Cassiopeiae.		$\mu$ Andromedæ.		43 Cephei (H.).		$\epsilon$ Piscium.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 0 43	° ' + 7 5	h m 0 51	° ' + 60 13	h m 0 51	° ' + 38 0	h m 0 55	° ' + 85 46	h m 0 58	° ' + 7 24
	s	"	s	"	s	"	s	"	s	"
Jan. 0.3	59.78	39.4	14.78	58.3	44.17	47.2	72.63	44.4	15.42	17.0
10.2	59.67	38.8	14.44	58.2	44.00	46.7	69.73	44.9	15.31	16.4
20.2	59.56	38.1	14.10	57.6	43.83	45.9	66.82	44.8	15.19	15.7
30.2	59.46	37.4	13.77	56.4	43.66	44.8	63.99	44.1	15.08	15.1
Feb. 9.2	59.36	36.8	13.47	54.9	43.50	43.4	61.36	42.7	14.97	14.5
19.1	59.27	36.2	13.20	52.9	43.36	41.8	59.04	40.8	14.88	13.9
Mar. 1.1	59.21	35.8	12.98	50.6	43.25	40.1	57.11	38.5	14.81	13.5
11.1	59.18	35.5	12.83	48.1	43.18	38.3	55.64	35.8	14.76	13.2
21.0	59.18	35.4	12.75	45.5	43.16	36.6	54.70	32.8	14.75	13.0
31.0	59.22	35.5	12.75	43.0	43.18	35.0	54.30	29.8	14.77	13.1
Apr. 10.0	59.30	35.8	12.84	40.6	43.26	33.5	54.47	26.8	14.83	13.5
20.0	59.42	36.4	13.01	38.4	43.39	32.3	55.19	23.9	14.94	14.0
29.9	59.58	37.3	13.27	36.5	43.58	31.5	56.43	21.2	15.09	14.9
May 9.9	59.78	38.4	13.60	35.0	43.81	31.0	58.14	18.9	15.28	16.0
19.9	60.02	39.8	13.99	33.9	44.09	30.9	60.25	17.0	15.51	17.3
29.9	60.29	41.4	14.44	33.3	44.40	31.2	62.69	15.6	15.77	18.9
June 8.8	60.59	43.2	14.93	33.2	44.75	31.9	65.38	14.7	16.06	20.6
18.8	60.90	45.1	15.45	33.7	45.12	33.0	68.25	14.3	16.36	22.5
28.8	61.22	47.1	15.99	34.6	45.50	34.4	71.21	14.5	16.68	24.5
July 8.7	61.54	49.2	16.52	36.0	45.88	36.2	74.18	15.3	17.01	26.5
18.7	61.86	51.2	17.04	37.8	46.24	38.2	77.09	16.5	17.32	28.6
28.7	62.16	53.2	17.53	40.0	46.59	40.5	79.87	18.3	17.62	30.5
Aug. 7.7	62.43	55.1	17.99	42.6	46.92	42.9	82.46	20.6	17.91	32.4
17.6	62.68	56.8	18.41	45.4	47.21	45.5	84.80	23.3	18.17	34.1
27.6	62.90	58.4	18.77	48.5	47.47	48.1	86.85	26.3	18.40	35.7
Sept. 6.6	63.08	59.7	19.07	51.7	47.69	50.8	88.57	29.7	18.59	37.0
16.5	63.23	60.8	19.32	55.0	47.87	53.4	89.91	33.3	18.76	38.1
26.5	63.35	61.7	19.50	58.4	48.01	55.9	90.85	37.0	18.89	39.0
Oct. 6.5	63.43	62.3	19.62	61.7	48.11	58.3	91.37	40.9	18.98	39.7
16.5	63.48	62.8	19.67	65.0	48.17	60.5	91.45	44.8	19.04	40.1
26.5	63.49	63.0	19.66	68.0	48.19	62.6	91.07	48.6	19.08	40.4
Nov. 5.4	63.48	63.0	19.60	70.9	48.17	64.4	90.25	52.2	19.08	40.4
15.4	63.45	62.9	19.48	73.4	48.13	65.9	88.99	55.6	19.06	40.3
25.4	63.40	62.6	19.30	75.6	48.05	67.1	87.31	58.7	19.01	40.1
Dec. 5.3	63.33	62.3	19.08	77.4	47.95	68.0	85.25	61.3	18.95	39.7
15.3	63.24	61.8	18.82	78.7	47.82	68.5	82.86	63.5	18.87	39.2
25.3	63.14	61.2	18.52	79.5	47.68	68.7	80.22	65.0	18.78	38.7
35.3	63.04	60.6	18.20	79.7	47.52	68.5	77.40	66.0	18.67	38.1

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Andromedæ.			$\kappa$ Tucanæ.			$f$ Piscium.			$\theta^{\alpha}$ Ceti.			38 Cassiopeïæ.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.	
	h m I 4	° +35 8		h m I 12	° -69 20		h m I 13	° + 3 8		h m I 19	° - 8 38		h m I 24	° +69 47	
	s	"		s	"		s	"		s	"		s	"	
Jan. 0.3	40.36	.16	42.6	43.61	.53	99.2	8.61	.11	21.7	30.84	.11	60.0	29.87	.51	80.4
10.2	40.20	.16	42.2	43.08	.52	99.1	8.50	.11	21.0	30.73	.12	60.7	29.36	.53	80.9
20.2	40.04	.16	41.5	42.56	.50	98.3	8.39	.12	20.4	30.61	.12	61.2	28.83	.54	80.9
30.2	39.88	.16	40.5	42.06	.46	97.0	8.27	.11	19.9	30.49	.11	61.5	28.29	.51	80.3
Feb. 9.2	39.72	.14	39.3	41.60	.42	95.1	8.16	.10	19.4	30.38	.11	61.6	27.78	.47	79.1
19.1	39.58	.11	37.9	41.18	.35	92.7	8.06	.08	19.1	30.27	.09	61.5	27.31	.41	77.5
Mar. 1.1	39.47	.08	36.3	40.83	.28	89.9	7.98	.06	18.8	30.18	.06	61.2	26.90	.32	75.4
11.1	39.39	.03	34.7	40.55	.19	86.8	7.92	.03	18.8	30.12	.04	60.7	26.58	.22	73.0
21.0	39.36	.01	33.1	40.36	.11	83.3	7.89	.01	18.9	30.08	.00	59.9	26.36	.11	70.4
31.0	39.37	.06	31.6	40.25	.01	79.7	7.90	.05	19.2	30.08	.04	58.9	26.25	.01	67.7
Apr. 10.0	39.43	.11	30.3	40.24	.09	75.9	7.95	.09	19.8	30.12	.08	57.6	26.26	.14	65.0
20.0	39.54	.17	29.3	40.33	.20	72.1	8.04	.13	20.6	30.20	.13	56.1	26.40	.25	62.4
29.9	39.71	.22	28.5	40.53	.29	68.3	8.17	.18	21.7	30.33	.16	54.4	26.65	.37	60.0
May 9.9	39.93	.26	28.1	40.82	.38	64.6	8.35	.21	23.0	30.49	.21	52.5	27.02	.47	57.9
19.9	40.19	.30	28.0	41.20	.47	61.1	8.56	.25	24.5	30.70	.24	50.4	27.49	.56	56.2
29.9	40.49	.33	28.4	41.67	.54	57.9	8.81	.28	26.2	30.94	.28	48.3	28.05	.63	54.9
June 8.8	40.82	.35	29.1	42.21	.61	55.0	9.09	.30	28.1	31.22	.29	46.1	28.68	.69	54.1
18.8	41.17	.37	30.1	42.82	.65	52.5	9.39	.31	30.0	31.51	.31	43.8	29.37	.72	53.8
28.8	41.54	.37	31.5	43.47	.68	50.5	9.70	.32	32.0	31.82	.32	41.6	30.09	.73	54.1
July 8.8	41.91	.36	33.2	44.15	.70	49.0	10.02	.32	34.1	32.14	.32	39.5	30.82	.73	54.8
18.7	42.27	.35	35.2	44.85	.69	48.1	10.34	.31	36.1	32.46	.31	37.6	31.55	.71	56.1
28.7	42.62	.33	37.4	45.54	.66	47.8	10.65	.29	38.0	32.77	.29	35.9	32.26	.67	57.8
Aug. 7.7	42.95	.29	39.7	46.20	.62	48.0	10.94	.26	39.7	33.06	.28	34.4	32.93	.62	59.9
17.6	43.24	.27	42.1	46.82	.55	48.8	11.20	.24	41.3	33.34	.24	33.2	33.55	.57	62.4
27.6	43.51	.23	44.6	47.37	.47	50.2	11.44	.21	42.7	33.58	.22	32.3	34.12	.50	65.2
Sept. 6.6	43.74	.19	47.1	47.84	.38	52.0	11.65	.18	43.8	33.80	.18	31.7	34.62	.41	68.3
16.6	43.93	.15	49.5	48.22	.27	54.3	11.83	.14	44.7	33.98	.15	31.5	35.03	.34	71.6
26.5	44.08	.12	51.9	48.49	.17	56.9	11.97	.11	45.3	34.13	.11	31.5	35.37	.25	75.0
Oct. 6.5	44.20	.07	54.1	48.66	.06	59.8	12.08	.08	45.7	34.24	.08	31.8	35.62	.16	78.6
16.5	44.27	.04	56.2	48.72	.06	62.8	12.16	.04	45.9	34.32	.05	32.3	35.78	.07	82.1
26.5	44.31	.01	58.1	48.66	.16	65.8	12.20	.02	45.9	34.37	.02	33.1	35.85	.02	85.5
Nov. 5.4	44.32	.03	59.7	48.50	.25	68.7	12.22	.01	45.7	34.39	.01	34.0	35.83	.12	88.8
15.4	44.29	.06	61.1	48.25	.34	71.4	12.21	.03	45.3	34.38	.03	35.0	35.71	.20	91.9
25.4	44.23	.09	62.2	47.91	.41	73.7	12.18	.06	44.9	34.35	.06	36.0	35.51	.28	94.7
Dec. 5.3	44.14	.11	63.1	47.50	.47	75.6	12.12	.07	44.3	34.29	.07	37.0	35.23	.36	97.1
15.3	44.03	.13	63.6	47.03	.50	77.0	12.05	.09	43.7	34.22	.09	38.0	34.87	.43	99.1
25.3	43.90	.14	63.7	46.53	.52	77.8	11.96	.10	43.1	34.13	.11	38.8	34.44	.48	100.5
35.3	43.76		63.6	46.01		78.0	11.86		42.5	34.02		39.6	33.96		101.4

# FIXED STARS, 1910.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Piscium.			$\nu$ Andromedæ.			$\pi$ Piscium.			$\alpha$ Eridani. (Achernar.)			$\nu$ Piscium.		
	Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination South.		Right Ascension.	Declination North.	
	h m I 26	° ' " +14 52		h m I 31	° ' " +40 57		h m I 32	° ' " +11 40		h m I 34	° ' " -57 41		h m I 36	° ' " + 5 1	
	s	"		s	"		s	"		s	"		s	"	
Jan. 0.3	39.18	.11 55.1	.05	29.77	.17 27.9	.00	18.85	.11 51.4	.05	22.09	.32 59.6	.03	44.18	.11 53.2	.06
10.3	39.07	.12 54.6	.06	29.60	.19 27.9	.05	18.74	.12 50.9	.06	21.77	.32 59.9	.02	44.07	.12 52.6	.06
20.2	38.95	.13 54.0	.07	29.41	.19 27.4	.07	18.62	.13 50.3	.06	21.45	.31 59.7	.07	43.95	.12 52.0	.06
30.2	38.82	.13 53.3	.07	29.22	.19 26.7	.07	18.49	.13 49.7	.06	21.14	.31 59.0	.07	43.83	.12 51.4	.05
Feb. 9.2	38.69	.13 52.6	.07	29.03	.18 25.6	.11	18.37	.12 49.1	.06	20.83	.31 57.7	.13	43.71	.12 50.9	.03
		.11 52.6	.08		.18 25.6	.13		.12 49.1	.06		.28 57.7	.18		.12 50.9	.03
19.2	38.58	.10 51.8	.07	28.85	.15 24.3	.16	18.25	.10 48.5	.06	20.55	.24 55.9	.23	43.59	.10 50.6	.03
Mar. 1.1	38.48	.08 51.1	.06	28.70	.12 22.7	.17	18.15	.08 47.9	.05	20.31	.20 53.6	.26	43.49	.08 50.3	.02
11.1	38.40	.04 50.5	.05	28.51	.07 21.0	.17	18.07	.04 47.4	.03	20.11	.15 51.0	.30	43.41	.05 50.1	.01
21.1	38.36	.01 50.0	.05	28.36	.03 19.3	.17	18.03	.01 47.1	.03	19.96	.09 48.0	.33	43.36	.01 50.2	.02
31.1	38.35	.04 49.6	.01	28.48	.03 17.6	.16	18.02	.01 46.9	.01	19.87	.09 44.7	.33	43.35	.01 50.4	.02
		.04 49.6	.01		.03 17.6	.16		.03 46.9	.01		.03 44.7	.35		.02 50.4	.04
Apr. 10.0	38.39	.08 49.5	.01	28.51	.09 16.0	.14	18.05	.07 47.0	.03	19.84	.04 41.2	.36	43.37	.07 50.8	.07
20.0	38.47	.13 49.6	.04	28.60	.14 14.6	.12	18.12	.12 47.3	.05	19.88	.11 37.6	.37	43.44	.11 51.5	.09
30.0	38.60	.17 50.0	.06	28.74	.20 13.4	.09	18.24	.16 47.8	.08	19.99	.18 33.9	.36	43.55	.16 52.4	.12
May 9.9	38.77	.21 50.6	.09	28.94	.25 12.5	.05	18.40	.21 48.6	.10	20.17	.25 30.3	.35	43.71	.20 53.6	.14
19.9	38.98	.25 51.5	.11	29.19	.30 12.0	.01	18.61	.24 49.6	.13	20.42	.31 26.8	.34	43.91	.23 55.0	.15
		.25 51.5	.11		.30 12.0	.01		.24 49.6	.13		.31 26.8	.34		.23 55.0	.15
29.9	39.23	.28 52.6	.14	29.49	.33 11.9	.03	18.85	.27 50.9	.15	20.73	.37 23.4	.31	44.14	.27 56.5	.17
June 8.9	39.51	.31 54.0	.16	29.82	.37 12.2	.06	19.12	.30 52.4	.17	21.10	.42 20.3	.28	44.41	.29 58.2	.19
18.8	39.82	.32 55.6	.17	30.19	.38 12.8	.10	19.42	.32 54.1	.18	21.52	.45 17.5	.24	44.70	.31 60.1	.20
28.8	40.14	.32 57.3	.19	30.57	.39 13.8	.14	19.74	.32 55.9	.19	21.97	.48 15.1	.19	45.01	.31 62.1	.20
July 8.8	40.46	.33 59.2	.19	30.96	.39 15.2	.16	20.06	.32 57.8	.19	22.45	.48 13.2	.14	45.32	.31 64.0	.19
		.33 59.2	.19		.39 15.2	.16		.32 57.8	.19		.48 13.2	.14		.32 64.0	.20
18.7	40.79	.32 61.1	.20	31.35	.38 16.8	.19	20.38	.32 59.7	.20	22.94	.49 11.8	.09	45.64	.31 66.0	.19
28.7	41.11	.30 63.1	.20	31.73	.36 18.7	.22	20.70	.30 61.7	.19	23.43	.47 10.9	.03	45.95	.30 67.9	.18
Aug. 7.7	41.41	.28 65.1	.19	32.09	.34 20.9	.23	21.00	.28 63.6	.17	23.90	.44 10.6	.03	46.25	.28 69.7	.16
17.7	41.69	.25 67.0	.18	32.43	.31 23.2	.24	21.28	.25 65.3	.17	24.34	.41 10.9	.08	46.53	.25 71.3	.14
27.6	41.94	.23 68.8	.16	32.74	.27 25.6	.25	21.53	.23 67.0	.15	24.75	.36 11.7	.13	46.78	.23 72.7	.12
		.23 68.8	.16		.27 25.6	.25		.23 67.0	.15		.36 11.7	.13		.23 72.7	.12
Sept. 6.6	42.17	.19 70.4	.14	33.01	.23 28.1	.25	21.76	.19 68.5	.13	25.11	.30 13.0	.19	47.01	.20 73.9	.10
16.6	42.36	.16 71.8	.13	33.24	.20 30.6	.25	21.95	.17 69.8	.10	25.41	.24 14.9	.22	47.21	.17 74.9	.07
26.6	42.52	.12 73.1	.10	33.44	.16 33.1	.25	22.12	.13 70.8	.09	25.65	.17 17.1	.25	47.38	.13 75.6	.05
Oct. 6.5	42.64	.10 74.1	.09	33.60	.11 35.6	.23	22.25	.10 71.7	.07	25.82	.10 19.6	.28	47.51	.10 76.1	.02
16.5	42.74	.06 75.0	.07	33.71	.07 37.9	.22	22.35	.06 72.4	.05	25.92	.02 22.4	.29	47.61	.07 76.3	.01
		.06 75.0	.07		.07 37.9	.22		.06 72.4	.05		.02 22.4	.29		.07 76.3	.01
26.5	42.80	.03 75.7	.05	33.78	.04 40.1	.20	22.41	.04 72.9	.03	25.94	.04 25.3	.29	47.68	.04 76.4	.01
Nov. 5.4	42.83	.01 76.2	.03	33.82	.00 42.1	.18	22.45	.01 73.2	.01	25.90	.10 28.2	.27	47.72	.01 76.3	.03
15.4	42.84	.02 76.5	.01	33.82	.04 43.9	.15	22.46	.01 73.3	.00	25.80	.16 30.9	.25	47.73	.01 76.0	.04
25.4	42.82	.05 76.6	.00	33.78	.07 45.4	.12	22.45	.01 73.3	.02	25.64	.21 33.4	.22	47.72	.04 75.6	.05
Dec. 5.4	42.77	.07 76.6	.02	33.71	.11 46.6	.09	22.41	.06 73.1	.03	25.43	.25 35.6	.17	47.68	.06 75.1	.05
		.07 76.6	.02		.11 46.6	.09		.06 73.1	.03		.25 35.6	.17		.06 75.1	.05
15.3	42.70	.08 76.4	.03	33.60	.13 47.5	.05	22.35	.09 72.8	.04	25.18	.28 37.3	.12	47.62	.08 74.6	.05
25.3	42.62	.10 76.1	.04	33.47	.15 48.0	.02	22.26	.10 72.4	.05	24.90	.30 38.5	.07	47.54	.09 74.1	.06
35.3	42.52	.10 75.7		33.32			22.16			24.60			47.45		

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Piscium.			$\zeta$ Ceti.			$\beta$ Arietis.			$\delta$ Cassiopeiæ.			$\gamma$ Andromedæ.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m	s	'	h m	s	'	h m	s	'	h m	s	'	h m	s	'
	I 40	+	8 42	I 46	-	10 46	I 49	+	20 22	I 55	+	71 58	I 58	+	41 53
Jan. 0.3	37.76	.11	15.7	60.63	.11	54.4	39.29	.11	7.9	43.00	.55	84.8	21.53	.16	62.0
10.3	37.65	.12	15.2	60.52	.13	55.1	39.18	.13	7.6	42.45	.59	85.8	21.37	.19	62.2
20.3	37.53	.12	14.6	60.39	.13	55.7	39.05	.14	7.1	41.86	.61	86.2	21.18	.20	62.0
30.3	37.41	.13	14.0	60.26	.13	56.0	38.91	.14	6.5	41.25	.61	86.0	20.98	.20	61.5
Feb. 9.2	37.28	.12	13.5	60.13	.12	56.1	38.77	.14	5.7	40.64	.57	85.3	20.78	.19	60.7
19.2	37.16	.10	13.0	60.01	.11	56.0	38.63	.12	4.9	40.07	.52	84.0	20.59	.18	59.6
Mar. 1.1	37.06	.08	12.5	59.90	.09	55.7	38.51	.10	4.1	39.55	.44	82.3	20.41	.14	58.2
11.1	36.98	.06	12.2	59.81	.06	55.1	38.41	.06	3.3	39.11	.33	80.2	20.27	.11	56.7
21.1	36.92	.02	12.1	59.75	.03	54.2	38.35	.03	2.5	38.78	.22	77.7	20.16	.06	55.0
31.1	36.90	.03	12.1	59.72	.01	53.1	38.32	.01	1.9	38.56	.08	75.1	20.10	.00	53.4
Apr. 10.0	36.93	.06	12.3	59.73	.05	51.7	38.33	.06	1.5	38.48	.05	72.4	20.10	.05	51.8
20.0	36.99	.11	12.8	59.78	.10	50.1	38.39	.11	1.2	38.53	.19	69.7	20.15	.11	50.3
30.0	37.10	.16	13.5	59.88	.14	48.3	38.50	.15	1.2	38.72	.33	67.1	20.26	.17	49.0
May 9.9	37.26	.19	14.4	60.02	.19	46.3	38.65	.20	1.4	39.05	.44	64.8	20.43	.23	48.0
19.9	37.45	.24	15.5	60.21	.22	44.2	38.85	.24	1.9	39.49	.56	62.8	20.66	.28	47.3
29.9	37.69	.27	16.9	60.43	.26	41.9	39.09	.28	2.7	40.05	.64	61.2	20.94	.32	47.0
June 8.9	37.96	.29	18.5	60.69	.28	39.6	39.37	.30	3.7	40.69	.72	60.0	21.26	.36	47.0
18.8	38.25	.31	20.3	60.97	.30	37.3	39.67	.32	5.0	41.41	.77	59.3	21.62	.38	47.3
28.8	38.56	.32	22.1	61.27	.31	35.0	39.99	.33	6.5	42.18	.80	59.1	22.00	.39	48.1
July 8.8	38.88	.32	24.0	61.58	.32	32.9	40.32	.34	8.2	42.98	.82	59.3	22.39	.40	49.1
18.8	39.20	.31	26.0	61.90	.32	30.9	40.66	.32	10.0	43.80	.81	60.1	22.79	.39	50.5
28.7	39.51	.30	27.9	62.22	.30	29.1	40.98	.32	11.9	44.61	.79	61.4	23.18	.38	52.2
Aug. 7.7	39.81	.28	29.7	62.52	.29	27.6	41.30	.30	13.8	45.40	.75	63.1	23.56	.36	54.1
17.7	40.09	.26	31.4	62.81	.26	26.4	41.60	.28	15.7	46.15	.69	65.2	23.92	.34	56.2
27.7	40.35	.23	32.9	63.07	.23	25.5	41.88	.24	17.5	46.84	.63	67.6	24.26	.30	58.4
Sept. 6.6	40.58	.21	34.3	63.30	.21	25.0	42.12	.22	19.3	47.47	.56	70.4	24.56	.27	60.8
16.6	40.79	.17	35.4	63.51	.17	24.8	42.34	.19	20.9	48.03	.47	73.5	24.83	.23	63.2
26.6	40.96	.14	36.3	63.68	.14	25.0	42.53	.15	22.4	48.50	.38	76.7	25.06	.20	65.6
Oct. 6.5	41.10	.10	37.0	63.82	.11	25.4	42.68	.12	23.7	48.88	.28	80.1	25.26	.15	68.0
16.5	41.20	.08	37.5	63.93	.08	26.1	42.80	.09	24.9	49.16	.18	83.6	25.41	.12	70.3
26.5	41.28	.04	37.8	64.01	.04	27.0	42.89	.06	25.9	49.34	.08	87.1	25.53	.07	72.5
Nov. 5.5	41.32	.02	37.9	64.05	.02	28.0	42.95	.03	26.7	49.42	.03	90.5	25.60	.04	74.6
15.4	41.34	.01	37.8	64.07	.01	29.2	42.98	.00	27.3	49.39	.14	93.8	25.64	.01	76.5
25.4	41.33	.03	37.6	64.06	.04	30.4	42.98	.03	27.8	49.25	.24	96.8	25.63	.04	78.1
Dec. 5.4	41.30	.06	37.3	64.02	.06	31.6	42.95	.05	28.0	49.01	.34	99.6	25.59	.08	79.5
15.3	41.24	.07	36.9	63.96	.09	32.7	42.90	.08	28.1	48.67	.43	101.9	25.51	.11	80.6
25.3	41.17	.10	36.5	63.87	.10	33.7	42.82	.10	28.0	48.24	.50	103.8	25.40	.14	81.4
35.3	41.07		35.9	63.77		34.5	42.72		27.8	47.74		105.1	25.26		81.8

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Arietis.		$\beta$ Trianguli.		$\epsilon^1$ Ceti.		$\gamma$ Trianguli.		$\delta^7$ Ceti.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 2 2	° ' " +23 2	h m 2 4	° ' " +34 33	h m 2 8	° ' " +8 25	h m 2 11	° ' " +33 25	h m 2 12	° ' " - 6 49
Jan. 0.3	5.24	16.8	10.46	49.3	13.22	27.4	57.05	58.8	29.28	78.6
10.3	5.13	16.6	10.32	49.3	13.12	26.8	56.92	58.9	29.18	79.4
20.3	5.00	16.2	10.16	49.1	13.01	26.3	56.77	58.7	29.06	80.0
30.3	4.86	15.6	9.99	48.6	12.88	25.8	56.60	58.3	28.93	80.4
Feb. 9.2	4.71	14.9	9.82	47.9	12.74	25.3	56.43	57.6	28.79	80.7
19.2	4.56	14.1	9.65	46.9	12.61	24.9	56.26	56.7	28.66	80.8
Mar. 1.2	4.43	13.3	9.49	45.7	12.49	24.5	56.10	55.6	28.53	80.6
11.1	4.32	12.4	9.36	44.4	12.39	24.2	55.97	54.4	28.42	80.2
21.1	4.24	11.6	9.26	43.1	12.31	24.1	55.86	53.2	28.34	79.6
31.1	4.20	10.8	9.21	41.8	12.26	24.1	55.80	51.9	28.29	78.8
Apr. 10.0	4.20	10.2	9.20	40.6	12.26	24.4	55.79	50.7	28.28	77.7
20.0	4.25	9.8	9.25	39.5	12.30	24.8	55.83	49.7	28.31	76.3
30.0	4.35	9.6	9.35	38.6	12.38	25.4	55.92	48.9	28.38	74.8
May 10.0	4.49	9.6	9.51	38.0	12.51	26.3	56.06	48.3	28.50	73.0
19.9	4.68	9.9	9.71	37.7	12.68	27.5	56.26	48.0	28.66	71.1
29.9	4.92	10.5	9.97	37.6	12.90	28.8	56.51	48.0	28.86	69.0
June 8.9	5.19	11.4	10.26	37.9	13.14	30.3	56.79	48.3	29.10	66.9
18.9	5.49	12.5	10.58	38.5	13.42	32.0	57.11	48.9	29.37	64.7
28.8	5.81	13.8	10.93	39.5	13.72	33.7	57.45	49.8	29.66	62.5
July 8.8	6.14	15.3	11.30	40.7	14.03	35.6	57.81	51.0	29.96	60.3
18.8	6.48	17.0	11.67	42.2	14.35	37.5	58.17	52.5	30.28	58.3
28.7	6.82	18.8	12.03	43.9	14.67	39.3	58.53	54.1	30.59	56.5
Aug. 7.7	7.14	20.7	12.39	45.7	14.98	41.0	58.89	55.9	30.90	54.9
17.7	7.45	22.6	12.73	47.7	15.27	42.6	59.22	57.8	31.19	53.6
27.7	7.74	24.4	13.04	49.8	15.54	44.1	59.54	59.8	31.46	52.6
Sept. 6.6	8.00	26.2	13.33	52.0	15.79	45.4	59.83	61.9	31.71	51.8
16.6	8.23	27.9	13.58	54.1	16.02	46.5	60.09	63.9	31.94	51.4
26.6	8.43	29.5	13.80	56.2	16.21	47.3	60.32	65.9	32.13	51.4
Oct. 6.6	8.60	30.9	13.99	58.2	16.38	48.0	60.51	67.8	32.30	51.6
16.5	8.74	32.2	14.14	60.1	16.51	48.4	60.67	69.7	32.43	52.1
26.5	8.85	33.3	14.26	61.9	16.61	48.6	60.80	71.4	32.53	52.8
Nov. 5.5	8.92	34.3	14.34	63.5	16.69	48.6	60.89	72.9	32.60	53.6
15.4	8.96	35.1	14.38	65.0	16.73	48.5	60.94	74.3	32.64	54.6
25.4	8.97	35.7	14.39	66.3	16.75	48.3	60.96	75.5	32.66	55.7
Dec. 5.4	8.96	36.1	14.37	67.3	16.74	48.0	60.95	76.5	32.64	56.8
15.4	8.91	36.3	14.31	68.1	16.70	47.6	60.90	77.3	32.60	57.9
25.3	8.84	36.4	14.22	68.6	16.64	47.1	60.81	77.8	32.53	58.9
35.3	8.74	36.3	14.10	68.9	16.55	46.6	60.70	78.1	32.44	59.7

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Hydr.		$\epsilon$ Cassiopeæ.		$\xi$ Ceti.		$\mu$ Hydr.		$\delta$ Ceti.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 2 20	° ' " -69 3	h m 2 21	° ' " +66 59	h m 2 23	° ' " + 8 3	h m 2 33	° ' " -79 29	h m 2 34	° ' " - 0 3
	s	"	s	"	s	"	s	"	s	"
Jan. 0.3	10.43	88.1	37.85	67.4	21.95	23.8	38.23	88.3	51.84	37.2
10.3	9.91	89.0	37.47	68.6	21.85	23.3	37.09	89.1	51.75	38.0
20.3	9.36	89.2	37.04	69.3	21.74	22.7	35.90	89.3	51.64	38.6
30.3	8.79	88.8	36.58	69.4	21.61	22.2	34.68	88.9	51.51	39.1
Feb. 9.2	8.23	87.8	36.12	68.9	21.47	21.8	33.46	87.9	51.37	39.5
19.2	7.69	86.2	35.66	68.0	21.33	21.4	32.29	86.4	51.23	39.7
Mar. 1.2	7.19	84.2	35.23	66.5	21.20	21.0	31.19	84.3	51.09	39.8
11.1	6.74	81.7	34.86	64.7	21.09	20.8	30.19	81.7	50.97	39.7
21.1	6.36	78.8	34.56	62.5	21.00	20.7	29.32	78.8	50.88	39.4
31.1	6.06	75.5	34.35	60.2	20.94	20.8	28.59	75.6	50.81	39.0
Apr. 10.1	5.84	72.0	34.24	57.7	20.92	21.0	28.03	72.1	50.78	38.3
20.0	5.72	68.3	34.24	55.1	20.94	21.4	27.65	68.4	50.79	37.4
30.0	5.71	64.5	34.35	52.7	21.01	22.1	27.46	64.6	50.84	36.2
May 10.0	5.80	60.7	34.57	50.5	21.13	23.0	27.46	60.8	50.94	34.9
19.9	5.99	57.0	34.89	48.5	21.29	24.1	27.66	57.1	51.08	33.4
29.9	6.28	53.4	35.30	46.8	21.49	25.4	28.05	53.5	51.27	31.7
June 8.9	6.66	50.0	35.80	45.5	21.73	26.9	28.62	50.1	51.49	29.8
18.9	7.13	46.9	36.36	44.7	22.00	28.5	29.37	47.1	51.75	27.9
28.8	7.67	44.2	36.97	44.3	22.29	30.2	30.26	44.4	52.03	25.9
July 8.8	8.26	42.0	37.62	44.4	22.60	32.0	31.28	42.2	52.33	23.9
18.8	8.90	40.2	38.29	44.9	22.91	33.9	32.39	40.5	52.64	22.0
28.8	9.56	39.0	38.97	45.9	23.23	35.7	33.57	39.3	52.95	20.2
Aug. 7.7	10.23	38.4	39.63	47.3	23.54	37.4	34.78	38.7	53.26	18.6
17.7	10.88	38.4	40.27	49.1	23.84	39.0	35.99	38.8	53.56	17.1
27.7	11.50	39.0	40.88	51.3	24.12	40.4	37.15	39.4	53.84	15.9
Sept. 6.6	12.07	40.2	41.44	53.8	24.38	41.6	38.22	40.6	54.10	14.9
16.6	12.57	42.0	41.95	56.5	24.61	42.7	39.18	42.4	54.34	14.2
26.6	12.99	44.2	42.40	59.5	24.82	43.5	39.99	44.6	54.55	13.8
Oct. 6.6	13.31	46.8	42.78	62.6	25.00	44.1	40.62	47.3	54.74	13.7
16.5	13.54	49.7	43.09	65.8	25.15	44.4	41.05	50.2	54.90	13.8
26.5	13.65	52.8	43.32	69.1	25.27	44.6	41.26	53.4	55.02	14.1
Nov. 5.5	13.65	55.9	43.47	72.3	25.36	44.6	41.25	56.6	55.12	14.7
15.5	13.55	59.0	43.53	75.4	25.42	44.4	41.02	59.7	55.18	15.3
25.4	13.35	61.9	43.51	78.3	25.45	44.2	40.58	62.6	55.22	16.1
Dec. 5.4	13.06	64.5	43.41	81.0	25.45	43.8	39.93	65.3	55.23	16.9
15.4	12.68	66.7	43.22	83.4	25.42	43.4	39.11	67.5	55.21	17.7
25.3	12.23	68.4	42.95	85.3	25.37	42.9	38.15	69.2	55.16	18.5
35.3	11.73	69.6	42.61	86.8	25.29	42.4	37.06	70.4	55.09	19.3

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\theta$ Persei.		$\gamma$ Ceti.		$\sigma$ Arietis.		$\epsilon$ Arietis.		47 Cephei (H.).	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	$^{\text{h}} \text{ } ^{\text{m}} \text{ } ^{\text{s}}$ 2 38	$^{\circ} \text{ } ' \text{ } ''$ +48 50	$^{\text{h}} \text{ } ^{\text{m}} \text{ } ^{\text{s}}$ 2 38	$^{\circ} \text{ } ' \text{ } ''$ + 2 51	$^{\text{h}} \text{ } ^{\text{m}} \text{ } ^{\text{s}}$ 2 46	$^{\circ} \text{ } ' \text{ } ''$ +14 42	$^{\text{h}} \text{ } ^{\text{m}} \text{ } ^{\text{s}}$ 2 54	$^{\circ} \text{ } ' \text{ } ''$ +20 58	$^{\text{h}} \text{ } ^{\text{m}} \text{ } ^{\text{s}}$ 2 53	$^{\circ} \text{ } ' \text{ } ''$ +79 3
	$^{\text{s}}$	$''$	$^{\text{s}}$	$''$	$^{\text{s}}$	$''$	$^{\text{s}}$	$''$	$^{\text{s}}$	$''$
Jan. 0.3	2.42	64.0	37.88	22.0	30.99	42.4	3.49	53.7	65.59	65.0
10.3	2.25	64.7	37.79	21.4	30.90	42.1	3.40	53.6	64.79	66.9
20.3	2.04	65.1	37.68	20.8	30.79	41.8	3.29	53.4	63.87	68.3
30.3	1.81	65.1	37.55	20.3	30.66	41.3	3.15	53.1	62.86	69.1
Feb. 9.2	1.57	64.7	37.41	19.9	30.51	40.9	3.00	52.6	61.81	69.2
19.2	1.32	63.9	37.27	19.6	30.36	40.4	2.84	52.1	60.76	68.8
Mar. 1.2	1.09	62.7	37.13	19.4	30.22	40.0	2.68	51.6	59.75	67.8
11.2	0.88	61.3	37.01	19.4	30.09	39.5	2.54	51.0	58.83	66.2
21.1	0.71	59.7	36.91	19.5	29.98	39.1	2.42	50.4	58.05	64.3
31.1	0.59	58.0	36.84	19.8	29.90	38.9	2.34	49.8	57.43	61.9
Apr. 10.1	0.52	56.2	36.80	20.3	29.86	38.8	2.29	49.4	57.00	59.3
20.0	0.52	54.4	36.81	21.1	29.86	38.8	2.28	49.1	56.77	56.6
30.0	0.59	52.7	36.86	22.0	29.91	39.0	2.33	48.9	56.77	53.8
May 10.0	0.73	51.2	36.96	23.2	30.01	39.5	2.42	49.0	56.99	51.1
20.0	0.93	50.0	37.10	24.5	30.15	40.1	2.56	49.2	57.42	48.5
29.9	1.19	49.0	37.29	26.0	30.34	41.0	2.75	49.7	58.05	46.2
June 8.9	1.51	48.4	37.51	27.7	30.57	42.1	2.98	50.4	58.86	44.2
18.9	1.87	48.1	37.76	29.5	30.83	43.3	3.24	51.4	59.82	42.6
28.9	2.27	48.2	38.04	31.4	31.11	44.8	3.53	52.5	60.91	41.4
July 8.8	2.69	48.7	38.34	33.3	31.42	46.3	3.84	53.8	62.10	40.7
18.8	3.13	49.5	38.65	35.2	31.74	47.9	4.17	55.2	63.36	40.5
28.8	3.57	50.6	38.96	37.0	32.06	49.5	4.50	56.7	64.66	40.8
Aug. 7.7	4.00	52.0	39.27	38.6	32.38	51.1	4.83	58.2	65.97	41.6
17.7	4.43	53.7	39.57	40.1	32.69	52.7	5.15	59.8	67.27	42.8
27.7	4.83	55.7	39.85	41.4	32.99	54.2	5.46	61.3	68.53	44.4
Sept. 6.7	5.21	57.8	40.12	42.4	33.27	55.6	5.75	62.8	69.73	46.5
16.6	5.56	60.1	40.36	43.2	33.52	56.8	6.02	64.2	70.84	49.0
26.6	5.87	62.4	40.58	43.7	33.75	57.8	6.27	65.5	71.85	51.8
Oct. 6.6	6.14	64.8	40.77	44.0	33.96	58.7	6.49	66.6	72.73	54.8
16.6	6.37	67.3	40.93	44.0	34.13	59.4	6.68	67.6	73.47	58.1
26.5	6.56	69.7	41.06	43.9	34.28	59.9	6.84	68.5	74.06	61.5
Nov. 5.5	6.70	72.1	41.16	43.5	34.40	60.2	6.97	69.2	74.48	65.0
15.5	6.80	74.3	41.23	43.0	34.48	60.4	7.07	69.8	74.71	68.5
25.4	6.85	76.4	41.27	42.4	34.54	60.5	7.13	70.3	74.75	71.9
Dec. 5.4	6.85	78.3	41.29	41.7	34.57	60.5	7.16	70.6	74.60	75.2
15.4	6.80	80.0	41.27	41.0	34.56	60.4	7.16	70.8	74.25	78.2
25.4	6.70	81.3	41.22	40.3	34.52	60.2	7.13	70.9	73.72	80.8
35.3	6.56	82.3	41.15	39.7	34.45	59.9	7.06	70.9	73.02	83.0

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ceti.		$\beta$ Persei.		$\delta$ Cephei (H.).		$\zeta$ Arietis.		$\alpha$ Persei.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 2 57	° ' " + 3 44	h m 3 2	° ' " + 40 36	h m 3 8	° ' " + 77 24	h m 3 9	° ' " + 20 42	h m 3 17	° ' " + 49 32
	s	"	s	"	s	"	s	"	s	"
Jan. 0.4	34.22	11.4	18.23	42.1	52.83	32.4	43.33	43.7	53.36	39.1
10.3	34.14	10.7	18.11	42.7	52.19	34.4	43.25	43.7	53.22	40.2
20.3	34.03	10.1	17.96	43.1	51.44	35.9	43.14	43.5	53.04	41.0
30.3	33.91	9.6	17.78	43.1	50.60	36.8	43.01	43.2	52.82	41.3
Feb. 9.2	33.77	9.2	17.58	42.9	49.71	37.1	42.86	42.9	52.58	41.3
19.2	33.62	8.9	17.37	42.3	48.80	36.9	42.70	42.4	52.32	41.0
Mar. 1.2	33.48	8.7	17.16	41.5	47.92	36.1	42.54	41.9	52.06	40.2
11.2	33.34	8.7	16.97	40.5	47.10	34.7	42.39	41.4	51.82	39.2
21.1	33.23	8.8	16.81	39.3	46.39	32.9	42.26	40.9	51.61	37.9
31.1	33.14	9.0	16.69	38.0	45.81	30.7	42.16	40.4	51.44	36.4
Apr. 10.1	33.09	9.5	16.61	36.6	45.39	28.2	42.10	40.0	51.33	34.7
20.1	33.08	10.2	16.59	35.2	45.15	25.5	42.08	39.7	51.27	33.0
30.0	33.12	11.0	16.63	34.0	45.10	22.8	42.11	39.5	51.29	31.3
May 10.0	33.20	12.1	16.72	32.9	45.24	20.1	42.18	39.5	51.37	29.7
20.0	33.32	13.3	16.88	32.0	45.57	17.5	42.31	39.8	51.52	28.3
29.9	33.49	14.8	17.09	31.4	46.07	15.2	42.48	40.2	51.73	27.1
June 8.9	33.70	16.4	17.35	31.0	46.74	13.1	42.70	40.9	52.01	26.1
18.9	33.94	18.1	17.65	30.9	47.56	11.4	42.95	41.7	52.34	25.5
28.9	34.21	19.9	17.99	31.1	48.49	10.1	43.23	42.8	52.71	25.2
July 8.8	34.50	21.7	18.36	31.6	49.52	9.3	43.54	44.0	53.11	25.2
18.8	34.81	23.5	18.74	32.4	50.62	8.9	43.86	45.3	53.54	25.6
28.8	35.12	25.3	19.13	33.4	51.76	9.0	44.19	46.7	53.98	26.2
Aug. 7.8	35.43	26.9	19.52	34.7	52.93	9.6	44.52	48.2	54.43	27.2
17.7	35.73	28.4	19.91	36.2	54.09	10.6	44.84	49.6	54.87	28.4
27.7	36.02	29.6	20.28	37.8	55.22	12.1	45.15	51.1	55.31	29.9
Sept. 6.7	36.29	30.7	20.63	39.6	56.31	13.9	45.45	52.5	55.72	31.6
16.6	36.55	31.5	20.96	41.5	57.33	16.2	45.73	53.8	56.11	33.5
26.6	36.78	32.0	21.26	43.4	58.27	18.8	45.99	54.9	56.47	35.5
Oct. 6.6	36.99	32.3	21.53	45.3	59.11	21.6	46.22	56.0	56.80	37.6
16.6	37.17	32.3	21.77	47.3	59.83	24.7	46.43	56.9	57.09	39.8
26.5	37.32	32.2	21.97	49.2	60.42	28.0	46.60	57.7	57.34	42.0
Nov. 5.5	37.44	31.9	22.14	51.0	60.86	31.4	46.75	58.4	57.55	44.3
15.5	37.53	31.4	22.26	52.8	61.15	34.8	46.87	58.9	57.71	46.5
25.5	37.59	30.8	22.35	54.4	61.27	38.2	46.95	59.3	57.83	48.6
Dec. 5.4	37.62	30.1	22.39	55.9	61.22	41.5	47.00	59.6	57.89	50.6
15.4	37.62	29.4	22.38	57.2	61.00	44.5	47.01	59.8	57.89	52.4
25.4	37.59	28.7	22.33	58.3	60.62	47.2	46.99	59.9	57.84	54.0
35.3	37.53	28.1	22.24	59.1	60.08	49.5	46.93	59.9	57.74	55.3



# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♈ Hydr.		♉ Tauri.		♊ Eridani.		♋ Persei.		♌ Camelopardalis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 3 18	° -77 42	h m 3 25	° +12 37	h m 3 28	° - 9 45	h m 3 36	° +47 29	h m 3 40	° +71 3
Jan. 0.4	16.22 0.90	79.9 1.5	54.05 0.06	44.6 0.4	41.46 0.08	49.3 1.2	30.69 0.11	70.7 1.1	51.25 0.32	33.2 2.1
10.3	15.32 0.98	81.4 0.9	53.99 0.10	44.2 0.3	41.38 0.10	50.5 0.9	30.58 0.16	71.8 0.8	50.93 0.41	35.3 1.7
20.3	14.34 1.05	82.3 0.3	53.89 0.12	43.9 0.4	41.28 0.13	51.4 0.7	30.42 0.19	72.6 0.5	50.52 0.50	37.0 1.2
30.3	13.29 1.07	82.6 0.3	53.77 0.14	43.5 0.4	41.15 0.15	52.1 0.5	30.23 0.23	73.1 0.2	50.02 0.55	38.2 0.6
Feb. 9.3	12.22 1.08	82.3 0.8	53.63 0.16	43.1 0.3	41.00 0.16	52.6 0.2	30.00 0.25	73.3 0.2	49.47 0.58	38.8 0.1
19.2	11.14 1.04	81.5 1.4	53.47 0.16	42.8 0.3	40.84 0.17	52.8 0.1	29.75 0.25	73.1 0.5	48.89 0.59	38.9 0.4
Mar. 1.2	10.10 0.99	80.1 1.9	53.31 0.15	42.5 0.3	40.67 0.15	52.7 0.3	29.50 0.24	72.6 0.9	48.30 0.56	38.5 1.0
11.2	9.11 0.90	78.2 2.4	53.16 0.13	42.2 0.2	40.52 0.14	52.4 0.5	29.26 0.21	71.7 1.1	47.74 0.51	37.5 1.4
21.2	8.21 0.80	75.8 2.7	53.03 0.11	42.0 0.1	40.38 0.12	51.9 0.8	29.05 0.18	70.6 1.3	47.23 0.43	36.1 1.8
31.1	7.41 0.67	73.1 3.1	52.92 0.07	41.9 0.0	40.26 0.09	51.1 1.1	28.87 0.13	69.3 1.5	46.80 0.34	34.3 2.1
Apr. 10.1	6.74 0.53	70.0 3.4	52.85 0.03	41.9 0.1	40.17 0.05	50.0 1.3	28.74 0.07	67.8 1.6	46.46 0.22	32.2 2.4
20.1	6.21 0.37	66.6 3.6	52.82 0.01	42.0 0.3	40.12 0.00	48.7 1.6	28.67 0.01	66.2 1.5	46.24 0.09	29.8 2.4
30.0	5.84 0.21	63.0 3.7	52.83 0.06	42.3 0.5	40.12 0.04	47.1 1.7	28.66 0.06	64.7 1.5	46.15 0.03	27.4 2.5
May 10.0	5.63 0.03	59.3 3.7	52.89 0.10	42.8 0.7	40.16 0.09	45.4 2.0	28.72 0.12	63.2 1.4	46.18 0.17	24.9 2.5
20.0	5.60 0.14	55.6 3.7	52.99 0.15	43.5 0.9	40.25 0.13	43.4 2.0	28.84 0.19	61.8 1.2	46.35 0.29	22.4 2.3
30.0	5.74 0.31	51.9 3.6	53.14 0.19	44.4 1.0	40.38 0.17	41.4 2.2	29.03 0.24	60.6 0.9	46.64 0.41	20.1 2.0
June 8.9	6.05 0.47	48.3 3.3	53.33 0.23	45.4 1.2	40.55 0.21	39.2 2.3	29.27 0.30	59.7 0.7	47.05 0.52	18.1 1.8
18.9	6.52 0.62	45.0 3.1	53.56 0.26	46.6 1.3	40.76 0.24	36.9 2.2	29.57 0.35	59.0 0.4	47.57 0.61	16.3 1.4
28.9	7.14 0.76	41.9 2.7	53.82 0.29	47.9 1.4	41.00 0.26	34.7 2.2	29.92 0.38	58.6 0.1	48.18 0.68	14.9 1.0
July 8.9	7.90 0.86	39.2 2.2	54.11 0.30	49.3 1.5	41.26 0.29	32.5 2.1	30.30 0.40	58.5 0.2	48.86 0.74	13.9 0.7
18.8	8.76 0.95	37.0 1.7	54.41 0.31	50.8 1.5	41.55 0.30	30.4 1.9	30.70 0.43	58.7 0.5	49.60 0.79	13.2 0.2
28.8	9.71 1.01	35.3 1.2	54.72 0.32	52.3 1.5	41.85 0.30	28.5 1.7	31.13 0.43	59.2 0.8	50.39 0.81	13.0 0.3
Aug. 7.8	10.72 1.04	34.1 0.6	55.04 0.32	53.8 1.4	42.15 0.31	26.8 1.4	31.56 0.43	60.0 1.1	51.20 0.82	13.3 0.6
17.7	11.76 1.03	33.5 0.0	55.36 0.30	55.2 1.3	42.46 0.29	25.4 1.1	31.99 0.42	61.1 1.2	52.02 0.82	13.9 1.0
27.7	12.79 1.00	33.5 0.7	55.66 0.29	56.5 1.1	42.75 0.28	24.3 0.7	32.41 0.41	62.3 1.5	52.84 0.79	14.9 1.4
Sept. 6.7	13.79 0.93	34.2 1.2	55.95 0.28	57.6 1.0	43.03 0.27	23.6 0.4	32.82 0.39	63.8 1.6	53.63 0.77	16.3 1.8
16.7	14.72 0.83	35.4 1.8	56.23 0.26	58.6 0.8	43.30 0.25	23.2 0.0	33.21 0.37	65.4 1.8	54.40 0.72	18.1 2.2
26.6	15.55 0.70	37.2 2.3	56.49 0.23	59.4 0.7	43.55 0.22	23.2 0.4	33.58 0.34	67.2 1.9	55.12 0.66	20.3 2.4
Oct. 6.6	16.25 0.55	39.5 2.7	56.72 0.21	60.1 0.4	43.77 0.20	23.6 0.7	33.92 0.31	69.1 2.0	55.78 0.59	22.7 2.6
16.6	16.80 0.38	42.2 3.0	56.93 0.19	60.5 0.3	43.97 0.18	24.3 0.9	34.23 0.27	71.1 2.0	56.37 0.51	25.3 2.9
26.6	17.18 0.20	45.2 3.2	57.12 0.16	60.8 0.1	44.15 0.14	25.2 1.2	34.50 0.23	73.1 2.0	56.88 0.43	28.2 3.0
Nov. 5.5	17.38 0.00	48.4 3.3	57.28 0.12	60.9 0.0	44.29 0.11	26.4 1.3	34.73 0.19	75.1 2.1	57.31 0.32	31.2 3.1
15.5	17.38 0.19	51.7 3.2	57.40 0.10	60.9 0.1	44.40 0.08	27.7 1.5	34.92 0.14	77.2 1.9	57.63 0.22	34.3 3.1
25.5	17.19 0.38	54.9 3.0	57.50 0.06	60.8 0.2	44.48 0.05	29.2 1.5	35.06 0.09	79.1 1.9	57.85 0.10	37.4 3.0
Dec. 5.4	16.81 0.55	57.9 2.7	57.56 0.03	60.6 0.3	44.53 0.01	30.7 1.4	35.15 0.03	81.0 1.8	57.95 0.01	40.4 2.9
15.4	16.26 0.70	60.6 2.3	57.59 0.01	60.3 0.3	44.54 0.02	32.1 1.4	35.18 0.02	82.8 1.5	57.94 0.13	43.3 2.6
25.4	15.56 0.83	62.9 1.8	57.58 0.05	60.0 0.3	44.52 0.05	33.5 1.2	35.16 0.08	84.3 1.3	57.81 0.25	45.9 2.4
35.4	14.73	64.7	57.53	59.7	44.47	34.7	35.08	85.6	57.56	48.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Tauri.		$\zeta$ Persei.		$\gamma$ Hydri.		$\epsilon$ Persei.		$\gamma$ Eridani.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 3 42	° ' " +23 49	h m 3 48	° ' " +31 37	h m 3 48	° ' " -74 30	h m 3 51	° ' " +39 45	h m 3 53	° ' " -13 45
Jan. 0.4	7.86	.05 42.5	28.26	.06 6.7	41.80	.64 67.9	48.68	.08 9.2	50.05	.06 55.3
10.3	7.80	.09 42.6	28.20	.11 7.3	41.16	.74 69.8	48.60	.11 10.1	49.99	.10 56.7
20.3	7.71	.13 42.7	28.09	.13 7.6	40.42	.80 71.2	48.49	.16 10.8	49.89	.13 57.8
30.3	7.58	.15 42.6	27.96	.17 7.8	39.62	.84 72.0	48.33	.19 11.2	49.76	.15 58.7
Feb. 9.3	7.43	.17 42.4	27.79	.18 7.7	38.78	.87 72.3	48.14	.20 11.3	49.61	.17 59.3
19.2	7.26	.17 42.1	27.61	.19 7.5	37.91	.86 72.0	47.94	.22 11.2	49.44	.17 59.6
Mar. 1.2	7.09	.17 41.7	27.42	.18 7.1	37.05	.83 71.1	47.72	.21 10.8	49.27	.17 59.6
11.2	6.92	.15 41.2	27.24	.17 6.6	36.22	.78 69.7	47.51	.19 10.2	49.10	.15 59.3
21.2	6.77	.13 40.7	27.07	.14 5.9	35.44	.71 67.8	47.32	.16 9.4	48.95	.14 58.7
31.1	6.64	.09 40.2	26.93	.11 5.2	34.73	.64 65.4	47.16	.12 8.4	48.81	.11 57.9
Apr. 10.1	6.55	.05 39.7	26.82	.06 4.4	34.11	.51 62.7	47.04	.08 7.2	48.70	.07 56.7
20.1	6.50	.00 39.3	26.76	.01 3.6	33.60	.39 59.6	46.96	.02 6.1	48.63	.03 55.3
30.1	6.50	.05 39.0	26.75	.04 2.8	33.21	.26 56.2	46.94	.04 4.9	48.60	.01 53.7
May 10.0	6.55	.10 38.8	26.79	.10 2.2	32.95	.12 52.7	46.98	.10 3.8	48.61	.06 51.8
20.0	6.65	.14 38.8	26.89	.15 1.7	32.83	.02 49.0	47.08	.13 2.9	48.67	.11 49.7
30.0	6.79	.19 38.9	27.04	.19 1.3	32.85	.16 45.3	47.23	.21 2.1	48.78	.15 47.5
June 8.9	6.98	.23 39.3	27.23	.24 1.2	33.01	.30 41.7	47.44	.26 1.5	48.93	.19 45.2
18.9	7.21	.27 39.8	27.47	.28 1.3	33.31	.42 38.2	47.70	.30 1.1	49.12	.22 42.8
28.9	7.48	.29 40.5	27.75	.31 1.6	33.73	.54 34.9	48.00	.33 0.9	49.34	.25 40.4
July 8.9	7.77	.32 41.4	28.06	.33 2.1	34.27	.64 31.9	48.33	.36 1.0	49.59	.28 38.1
18.8	8.09	.32 42.4	28.39	.34 2.7	34.91	.72 29.3	48.69	.37 1.4	49.87	.29 35.9
28.8	8.41	.34 43.5	28.73	.36 3.6	35.63	.79 27.2	49.06	.39 1.9	50.16	.30 33.9
Aug. 7.8	8.75	.33 44.7	29.09	.35 4.6	36.42	.83 25.6	49.45	.39 2.7	50.46	.30 32.2
17.8	9.08	.33 46.0	29.44	.35 5.7	37.25	.84 24.6	49.84	.37 3.7	50.76	.30 30.7
27.7	9.41	.32 47.2	29.79	.34 6.9	38.09	.83 24.2	50.22	.37 4.8	51.06	.30 29.7
Sept. 6.7	9.73	.30 48.4	30.13	.33 8.1	38.92	.79 24.4	50.59	.36 6.1	51.36	.28 29.0
16.7	10.03	.28 49.6	30.46	.31 9.4	39.71	.73 25.3	50.95	.34 7.4	51.64	.26 28.7
26.6	10.31	.27 50.7	30.77	.29 10.6	40.44	.64 26.7	51.29	.32 8.9	51.90	.25 28.8
Oct. 6.6	10.58	.24 51.7	31.06	.26 11.9	41.08	.54 28.7	51.61	.29 10.4	52.15	.23 29.3
16.6	10.82	.21 52.6	31.32	.23 13.1	41.62	.41 31.2	51.90	.26 11.9	52.37	.20 30.1
26.6	11.03	.19 53.4	31.55	.21 14.3	42.03	.28 34.1	52.16	.23 13.5	52.57	.17 31.3
Nov. 5.5	11.22	.15 54.1	31.76	.17 15.4	42.31	.13 37.2	52.39	.19 15.0	52.74	.13 32.7
15.5	11.37	.12 54.8	31.93	.14 16.5	42.44	.03 40.5	52.58	.15 16.6	52.87	.11 34.3
25.5	11.49	.08 55.3	32.07	.09 17.5	42.41	.18 43.8	52.73	.11 18.1	52.98	.07 36.0
Dec. 5.5	11.57	.05 55.8	32.16	.06 18.5	42.23	.33 47.0	52.84	.05 19.5	53.05	.03 37.8
15.4	11.62	.01 56.2	32.22	.01 19.3	41.90	.46 50.0	52.89	.01 20.8	53.08	.01 39.5
25.4	11.63	.03 56.5	32.23	.03 20.0	41.44	.58 52.6	52.90	.04 22.0	53.07	.04 41.2
35.4	11.60	.03 56.7	32.20	.03 20.6	40.86	.58 54.8	52.86	.04 23.0	53.03	.04 42.6

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	A <sup>1</sup> Tauri.		ε Persei.		α <sup>2</sup> Eridani.		γ Tauri.		ε Tauri.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 3 59	° ' " +21 50	h m 4 2	° ' " +47 28	h m 4 7	° ' " - 7 3	h m 4 14	° ' " +15 24	h m 4 23	° ' " +18 58
Jan. 0.4	22.36	04 15.3	7.56	08 31.1	28.52	05 80.7	40.29	03 41.5	21.70	03 56.2
10.4	22.32	09 15.4	7.48	13 32.4	28.47	08 81.9	40.26	07 41.3	21.67	06 56.2
20.4	22.23	11 15.4	7.35	18 33.4	28.39	12 82.9	40.19	11 41.1	21.61	10 56.1
30.3	22.12	15 15.3	7.17	22 34.1	28.27	14 83.7	40.08	13 40.8	21.51	14 56.1
Feb. 9.3	21.97	16 15.2	6.95	24 34.5	28.13	15 84.3	39.95	15 40.6	21.37	15 55.9
19.3	21.81	17 15.0	6.71	25 34.6	27.98	17 84.7	39.80	17 40.4	21.22	17 55.8
Mar. 1.2	21.64	17 14.7	6.46	25 34.3	27.81	17 84.8	39.63	16 40.2	21.05	17 55.6
11.2	21.47	16 14.4	6.21	23 33.7	27.64	15 84.7	39.47	16 40.0	20.88	17 55.4
21.2	21.31	14 14.0	5.98	20 32.8	27.49	14 84.3	39.31	14 39.8	20.71	14 55.1
31.2	21.17	10 13.6	5.78	15 31.6	27.35	11 83.7	39.17	11 39.6	20.57	12 54.9
Apr. 10.1	21.07	06 13.2	5.63	11 30.3	27.24	08 82.9	39.06	07 39.5	20.45	08 54.7
20.1	21.01	02 12.9	5.52	04 28.9	27.16	03 81.8	38.99	03 39.5	20.37	04 54.6
30.1	20.99	03 12.7	5.48	03 27.4	27.13	00 80.5	38.96	01 39.7	20.33	01 54.5
May 10.0	21.02	08 12.6	5.51	09 25.9	27.13	05 79.0	38.97	06 39.9	20.34	05 54.5
20.0	21.10	13 12.6	5.60	15 24.5	27.18	10 77.3	39.03	11 40.3	20.39	10 54.7
30.0	21.23	17 12.9	5.75	22 23.2	27.28	14 75.5	39.14	15 40.9	20.49	15 55.0
June 9.0	21.40	21 13.3	5.97	27 22.2	27.42	18 73.5	39.29	19 41.6	20.64	19 55.5
18.9	21.61	25 13.8	6.24	32 21.3	27.60	22 71.4	39.48	23 42.5	20.83	22 56.1
28.9	21.86	28 14.5	6.56	36 20.7	27.82	24 69.3	39.71	26 43.5	21.05	26 56.9
July 8.9	22.14	30 15.4	6.92	39 20.4	28.06	27 67.3	39.97	28 44.5	21.31	29 57.7
18.9	22.44	32 16.4	7.31	41 20.3	28.33	28 65.3	40.25	30 45.7	21.60	30 58.7
28.8	22.76	33 17.4	7.72	43 20.5	28.61	30 63.4	40.55	31 46.8	21.90	31 59.7
Aug. 7.8	23.09	33 18.5	8.15	43 21.0	28.91	30 61.8	40.86	31 48.0	22.21	31 60.7
17.8	23.42	32 19.7	8.58	43 21.8	29.21	30 60.4	41.18	31 49.2	22.53	31 61.7
27.8	23.74	32 20.8	9.01	42 22.7	29.51	29 59.2	41.49	31 50.2	22.85	31 62.7
Sept. 6.7	24.06	31 21.9	9.43	41 23.9	29.80	28 58.4	41.80	30 51.2	23.17	30 63.6
16.7	24.37	29 22.9	9.84	39 25.2	30.08	27 58.0	42.10	29 52.0	23.48	29 64.5
26.7	24.66	27 23.8	10.23	37 26.7	30.35	25 57.9	42.39	27 52.7	23.78	27 65.2
Oct. 6.6	24.93	25 24.6	10.60	34 28.3	30.60	23 58.1	42.66	25 53.2	24.06	25 65.8
16.6	25.18	23 25.4	10.94	30 30.1	30.83	21 58.7	42.91	23 53.6	24.32	23 66.3
26.6	25.41	20 26.0	11.24	27 31.9	31.04	19 59.5	43.14	21 53.8	24.57	21 66.6
Nov. 5.6	25.61	17 26.5	11.51	22 33.8	31.23	15 60.6	43.35	18 53.9	24.79	18 66.9
15.5	25.78	14 27.0	11.73	18 35.7	31.38	12 61.9	43.53	15 53.9	24.98	15 67.0
25.5	25.92	10 27.4	11.91	13 37.6	31.50	09 63.3	43.68	11 53.8	25.14	11 67.1
Dec. 5.5	26.02	06 27.7	12.04	07 39.4	31.59	05 64.7	43.79	08 53.7	25.27	08 67.2
15.4	26.08	03 27.9	12.11	01 41.2	31.64	02 66.2	43.87	03 53.5	25.35	03 67.2
25.4	26.11	02 28.1	12.12	04 42.8	31.66	03 67.6	43.90	00 53.3	25.40	00 67.2
35.4	26.09	02 28.2	12.08	04 44.2	31.63	03 68.8	43.90	00 53.1	25.40	00 67.2

## FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Mensæ.		$m$ Persei.		$\alpha$ Tauri. (Aldebaran.)		$\tau$ Tauri.		$\alpha$ Camelopardalis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 4 23	° -80 25	h m 4 27	° +42 52	h m 4 30	° +16 19	h m 4 36	° +22 47	h m 4 45	° +66 11
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 0.4	70.69 <sub>0.99</sub>	42.1 <sub>2.3</sub>	4.97 <sub>.04</sub>	27.8 <sub>1.2</sub>	45.43 <sub>.02</sub>	46.9 <sub>0.2</sub>	50.66 <sub>.01</sub>	9.4 <sub>0.2</sub>	6.83 <sub>.10</sub>	36.7 <sub>2.4</sub>
10.4	69.70 <sub>1.16</sub>	44.4 <sub>1.8</sub>	4.93 <sub>.10</sub>	29.0 <sub>1.0</sub>	45.41 <sub>.06</sub>	46.7 <sub>0.1</sub>	50.65 <sub>.06</sub>	9.6 <sub>0.1</sub>	6.73 <sub>.20</sub>	39.1 <sub>2.1</sub>
20.4	68.54 <sub>1.30</sub>	46.2 <sub>1.3</sub>	4.83 <sub>.14</sub>	30.0 <sub>0.8</sub>	45.35 <sub>.10</sub>	46.6 <sub>0.2</sub>	50.59 <sub>.10</sub>	9.7 <sub>0.1</sub>	6.53 <sub>.29</sub>	41.2 <sub>1.7</sub>
30.3	67.24 <sub>1.40</sub>	47.5 <sub>0.8</sub>	4.69 <sub>.18</sub>	30.8 <sub>0.5</sub>	45.25 <sub>.13</sub>	46.4 <sub>0.2</sub>	50.49 <sub>.13</sub>	9.8 <sub>0.0</sub>	6.24 <sub>.37</sub>	42.9 <sub>1.3</sub>
Feb. 9.3	65.84 <sub>1.45</sub>	48.3 <sub>0.2</sub>	4.51 <sub>.21</sub>	31.3 <sub>0.2</sub>	45.12 <sub>.15</sub>	46.2 <sub>0.1</sub>	50.36 <sub>.15</sub>	9.8 <sub>0.0</sub>	5.87 <sub>.42</sub>	44.2 <sub>0.8</sub>
19.3	64.39 <sub>1.48</sub>	48.5 <sub>0.4</sub>	4.30 <sub>.23</sub>	31.5 <sub>0.1</sub>	44.97 <sub>.16</sub>	46.1 <sub>0.2</sub>	50.21 <sub>.18</sub>	9.8 <sub>0.2</sub>	5.45 <sub>.45</sub>	45.0 <sub>0.3</sub>
Mar. 1.3	62.91 <sub>1.45</sub>	48.1 <sub>0.9</sub>	4.07 <sub>.23</sub>	31.4 <sub>0.3</sub>	44.81 <sub>.17</sub>	45.9 <sub>0.2</sub>	50.03 <sub>.18</sub>	9.6 <sub>0.2</sub>	5.00 <sub>.46</sub>	45.3 <sub>0.1</sub>
11.2	61.46 <sub>1.40</sub>	47.2 <sub>1.5</sub>	3.84 <sub>.22</sub>	31.1 <sub>0.6</sub>	44.64 <sub>.17</sub>	45.7 <sub>0.2</sub>	49.85 <sub>.17</sub>	9.4 <sub>0.2</sub>	4.54 <sub>.45</sub>	45.2 <sub>0.6</sub>
21.2	60.06 <sub>1.32</sub>	45.7 <sub>1.9</sub>	3.62 <sub>.20</sub>	30.5 <sub>0.9</sub>	44.47 <sub>.14</sub>	45.5 <sub>0.1</sub>	49.68 <sub>.15</sub>	9.2 <sub>0.3</sub>	4.09 <sub>.41</sub>	44.6 <sub>1.1</sub>
31.2	58.74 <sub>1.19</sub>	43.8 <sub>2.3</sub>	3.42 <sub>.16</sub>	29.6 <sub>1.0</sub>	44.33 <sub>.12</sub>	45.4 <sub>0.1</sub>	49.53 <sub>.13</sub>	8.9 <sub>0.3</sub>	3.68 <sub>.36</sub>	43.5 <sub>1.5</sub>
Apr. 10.1	57.55 <sub>1.04</sub>	41.5 <sub>2.7</sub>	3.26 <sub>.12</sub>	28.6 <sub>1.1</sub>	44.21 <sub>.09</sub>	45.3 <sub>0.0</sub>	49.40 <sub>.10</sub>	8.6 <sub>0.3</sub>	3.32 <sub>.28</sub>	42.0 <sub>1.7</sub>
20.1	56.51 <sub>0.87</sub>	38.8 <sub>3.0</sub>	3.14 <sub>.06</sub>	27.5 <sub>1.2</sub>	44.12 <sub>.05</sub>	45.3 <sub>0.1</sub>	49.30 <sub>.05</sub>	8.3 <sub>0.2</sub>	3.04 <sub>.19</sub>	40.3 <sub>2.0</sub>
30.1	55.64 <sub>0.68</sub>	35.8 <sub>3.3</sub>	3.08 <sub>.00</sub>	26.3 <sub>1.2</sub>	44.07 <sub>.00</sub>	45.4 <sub>0.2</sub>	49.25 <sub>.00</sub>	8.1 <sub>0.2</sub>	2.85 <sub>.09</sub>	38.3 <sub>2.2</sub>
May 10.1	54.96 <sub>0.46</sub>	32.5 <sub>3.4</sub>	3.08 <sub>.06</sub>	25.1 <sub>1.2</sub>	44.07 <sub>.05</sub>	45.6 <sub>0.3</sub>	49.25 <sub>.04</sub>	7.9 <sub>0.0</sub>	2.76 <sub>.01</sub>	36.1 <sub>2.3</sub>
20.0	54.50 <sub>0.25</sub>	29.1 <sub>3.6</sub>	3.14 <sub>.11</sub>	23.9 <sub>1.1</sub>	44.12 <sub>.09</sub>	45.9 <sub>0.4</sub>	49.29 <sub>.09</sub>	7.9 <sub>0.0</sub>	2.77 <sub>.11</sub>	33.8 <sub>2.2</sub>
30.0	54.25 <sub>0.03</sub>	25.5 <sub>3.5</sub>	3.25 <sub>.18</sub>	22.8 <sub>0.9</sub>	44.21 <sub>.14</sub>	46.3 <sub>0.6</sub>	49.38 <sub>.14</sub>	7.9 <sub>0.2</sub>	2.88 <sub>.22</sub>	31.6 <sub>2.2</sub>
June 9.0	54.22 <sub>0.20</sub>	22.0 <sub>3.5</sub>	3.43 <sub>.23</sub>	21.9 <sub>0.8</sub>	44.35 <sub>.18</sub>	46.9 <sub>0.7</sub>	49.52 <sub>.18</sub>	8.1 <sub>0.4</sub>	3.10 <sub>.31</sub>	29.4 <sub>2.0</sub>
19.0	54.42 <sub>0.41</sub>	18.5 <sub>3.4</sub>	3.66 <sub>.27</sub>	21.1 <sub>0.5</sub>	44.53 <sub>.21</sub>	47.6 <sub>0.9</sub>	49.70 <sub>.22</sub>	8.5 <sub>0.4</sub>	3.41 <sub>.40</sub>	27.4 <sub>1.8</sub>
28.9	54.83 <sub>0.62</sub>	15.1 <sub>3.1</sub>	3.93 <sub>.32</sub>	20.6 <sub>0.3</sub>	44.74 <sub>.25</sub>	48.5 <sub>1.0</sub>	49.92 <sub>.25</sub>	8.9 <sub>0.6</sub>	3.81 <sub>.48</sub>	25.6 <sub>1.5</sub>
July 8.9	55.45 <sub>0.81</sub>	12.0 <sub>2.8</sub>	4.25 <sub>.35</sub>	20.3 <sub>0.1</sub>	44.99 <sub>.28</sub>	49.5 <sub>1.0</sub>	50.17 <sub>.29</sub>	9.5 <sub>0.7</sub>	4.29 <sub>.54</sub>	24.1 <sub>1.2</sub>
18.9	56.26 <sub>0.97</sub>	9.2 <sub>2.4</sub>	4.60 <sub>.37</sub>	20.2 <sub>0.1</sub>	45.27 <sub>.29</sub>	50.5 <sub>1.0</sub>	50.46 <sub>.30</sub>	10.2 <sub>0.8</sub>	4.83 <sub>.60</sub>	22.9 <sub>0.9</sub>
28.9	57.23 <sub>1.11</sub>	6.8 <sub>1.9</sub>	4.97 <sub>.39</sub>	20.3 <sub>0.3</sub>	45.56 <sub>.31</sub>	51.5 <sub>1.1</sub>	50.76 <sub>.31</sub>	11.0 <sub>0.9</sub>	5.43 <sub>.64</sub>	22.0 <sub>0.6</sub>
Aug. 7.8	58.34 <sub>1.21</sub>	4.9 <sub>1.3</sub>	5.36 <sub>.40</sub>	20.6 <sub>0.5</sub>	45.87 <sub>.31</sub>	52.6 <sub>1.0</sub>	51.07 <sub>.33</sub>	11.9 <sub>0.8</sub>	6.07 <sub>.67</sub>	21.4 <sub>0.3</sub>
17.8	59.55 <sub>1.27</sub>	3.6 <sub>0.8</sub>	5.76 <sub>.40</sub>	21.1 <sub>0.7</sub>	46.18 <sub>.32</sub>	53.6 <sub>1.0</sub>	51.40 <sub>.32</sub>	12.7 <sub>0.9</sub>	6.74 <sub>.68</sub>	21.1 <sub>0.2</sub>
27.8	60.82 <sub>1.30</sub>	2.8 <sub>0.2</sub>	6.16 <sub>.41</sub>	21.8 <sub>0.9</sub>	46.50 <sub>.31</sub>	54.6 <sub>0.8</sub>	51.72 <sub>.33</sub>	13.6 <sub>0.8</sub>	7.42 <sub>.69</sub>	21.3 <sub>0.5</sub>
Sept. 6.7	62.12 <sub>1.28</sub>	2.6 <sub>0.5</sub>	6.57 <sub>.39</sub>	22.7 <sub>1.0</sub>	46.81 <sub>.30</sub>	55.4 <sub>0.8</sub>	52.05 <sub>.32</sub>	14.4 <sub>0.8</sub>	8.11 <sub>.68</sub>	21.8 <sub>0.8</sub>
16.7	63.40 <sub>1.21</sub>	3.1 <sub>1.0</sub>	6.96 <sub>.38</sub>	23.7 <sub>1.1</sub>	47.11 <sub>.30</sub>	56.2 <sub>0.6</sub>	52.37 <sub>.31</sub>	15.2 <sub>0.7</sub>	8.79 <sub>.67</sub>	22.6 <sub>1.2</sub>
26.7	64.61 <sub>1.10</sub>	4.1 <sub>1.7</sub>	7.34 <sub>.36</sub>	24.8 <sub>1.3</sub>	47.41 <sub>.28</sub>	56.8 <sub>0.4</sub>	52.68 <sub>.30</sub>	15.9 <sub>0.6</sub>	9.46 <sub>.64</sub>	23.8 <sub>1.4</sub>
Oct. 6.7	65.71 <sub>0.96</sub>	5.8 <sub>2.2</sub>	7.70 <sub>.34</sub>	26.1 <sub>1.3</sub>	47.69 <sub>.27</sub>	57.2 <sub>0.4</sub>	52.98 <sub>.28</sub>	16.5 <sub>0.5</sub>	10.10 <sub>.60</sub>	25.2 <sub>1.8</sub>
16.6	66.67 <sub>0.78</sub>	8.0 <sub>2.6</sub>	8.04 <sub>.31</sub>	27.4 <sub>1.4</sub>	47.96 <sub>.25</sub>	57.6 <sub>0.2</sub>	53.26 <sub>.26</sub>	17.0 <sub>0.5</sub>	10.70 <sub>.56</sub>	27.0 <sub>2.1</sub>
26.6	67.45 <sub>0.57</sub>	10.6 <sub>3.0</sub>	8.35 <sub>.28</sub>	28.8 <sub>1.5</sub>	48.21 <sub>.22</sub>	57.8 <sub>0.0</sub>	53.52 <sub>.24</sub>	17.5 <sub>0.4</sub>	11.26 <sub>.51</sub>	29.1 <sub>2.3</sub>
Nov. 5.6	68.02 <sub>0.33</sub>	13.6 <sub>3.2</sub>	8.63 <sub>.25</sub>	30.3 <sub>1.5</sub>	48.43 <sub>.19</sub>	57.8 <sub>0.0</sub>	53.76 <sub>.21</sub>	17.9 <sub>0.3</sub>	11.77 <sub>.43</sub>	31.4 <sub>2.4</sub>
15.5	68.35 <sub>0.08</sub>	16.8 <sub>3.3</sub>	8.88 <sub>.20</sub>	31.8 <sub>1.6</sub>	48.62 <sub>.17</sub>	57.8 <sub>0.1</sub>	53.97 <sub>.18</sub>	18.2 <sub>0.3</sub>	12.20 <sub>.35</sub>	33.8 <sub>2.6</sub>
25.5	68.43 <sub>0.17</sub>	20.1 <sub>3.3</sub>	9.08 <sub>.15</sub>	33.4 <sub>1.5</sub>	48.79 <sub>.13</sub>	57.7 <sub>0.1</sub>	54.15 <sub>.14</sub>	18.5 <sub>0.3</sub>	12.55 <sub>.27</sub>	36.4 <sub>2.7</sub>
Dec. 5.5	68.26 <sub>0.42</sub>	23.4 <sub>3.1</sub>	9.23 <sub>.11</sub>	34.9 <sub>1.5</sub>	48.92 <sub>.09</sub>	57.6 <sub>0.2</sub>	54.29 <sub>.11</sub>	18.8 <sub>0.2</sub>	12.82 <sub>.17</sub>	39.1 <sub>2.7</sub>
15.5	67.84 <sub>0.66</sub>	26.5 <sub>2.9</sub>	9.34 <sub>.05</sub>	36.4 <sub>1.4</sub>	49.01 <sub>.05</sub>	57.4 <sub>0.1</sub>	54.40 <sub>.06</sub>	19.0 <sub>0.2</sub>	12.99 <sub>.07</sub>	41.8 <sub>2.6</sub>
25.4	67.18 <sub>0.88</sub>	29.4 <sub>2.6</sub>	9.39 <sub>.00</sub>	37.8 <sub>1.2</sub>	49.06 <sub>.01</sub>	57.3 <sub>0.2</sub>	54.46 <sub>.01</sub>	19.2 <sub>0.2</sub>	13.06 <sub>.04</sub>	44.4 <sub>2.5</sub>
35.4	66.30	32.0	9.39	39.0	49.07	57.1	54.47	19.4	13.02	46.9

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♉ Tauri.			♊ Aurigæ.			♋ Aurigæ.			♌ Orionis.			♍ Eridani.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.	
	h m	°		h m	°		h m	°		h m	°		h m	°	
	4 46	+18 41		4 51	+33 1		4 56	+40 56		4 59	+15 16		5 3	-5 11	
	s	"	s	"	"	s	"	"	s	"	"	s	"	"	"
Jan. 0.4	6.65	17.4	0.0	8.06	32.8	0.0	11.39	49.3	1.2	25.75	48.5	0.2	25.87	68.1	1.3
10.4	6.64	17.4	0.0	8.06	33.5	0.7	11.39	50.5	1.0	25.76	48.3	0.2	25.87	69.4	1.1
20.4	6.59	17.4	0.1	8.00	34.2	0.5	11.33	51.5	0.9	25.72	48.1	0.2	25.82	70.5	0.9
30.4	6.50	17.3	0.1	7.90	34.7	0.4	11.22	52.4	0.6	25.64	47.9	0.2	25.74	71.4	0.8
Feb. 9.3	6.38	17.2	0.0	7.76	35.1	0.2	11.06	53.0	0.4	25.53	47.7	0.1	25.62	72.2	0.5
19.3	6.23	17.2	0.2	7.59	35.3	0.0	10.87	53.4	0.2	25.38	47.6	0.1	25.47	72.7	0.3
Mar. 1.3	6.07	17.0	0.1	7.40	35.3	0.1	10.65	53.6	0.1	25.22	47.5	0.1	25.31	73.0	0.1
11.2	5.89	16.9	0.2	7.20	35.2	0.3	10.43	53.5	0.3	25.05	47.4	0.1	25.13	73.1	0.1
21.2	5.72	16.7	0.1	7.01	34.9	0.5	10.21	53.2	0.6	24.88	47.3	0.0	24.96	73.0	0.4
31.2	5.57	16.6	0.2	6.83	34.4	0.6	10.00	52.6	0.8	24.72	47.3	0.0	24.80	72.6	0.6
Apr. 10.2	5.44	16.4	0.1	6.68	33.8	0.6	9.83	51.8	0.9	24.59	47.3	0.1	24.66	72.0	0.8
20.1	5.34	16.3	0.0	6.56	33.2	0.7	9.69	50.9	1.0	24.48	47.4	0.1	24.55	71.2	1.0
30.1	5.28	16.3	0.1	6.49	32.5	0.7	9.60	49.9	1.0	24.41	47.5	0.2	24.47	70.2	1.3
May 10.1	5.27	16.4	0.2	6.47	31.8	0.6	9.57	48.9	1.1	24.38	47.7	0.4	24.43	68.9	1.4
20.1	5.30	16.6	0.2	6.50	31.2	0.6	9.59	47.8	1.0	24.40	48.1	0.4	24.43	67.5	1.6
30.0	5.38	16.8	0.4	6.58	30.6	0.4	9.67	46.8	0.9	24.47	48.5	0.6	24.48	65.9	1.7
June 9.0	5.50	17.2	0.6	6.72	30.2	0.3	9.81	45.9	0.8	24.58	49.1	0.7	24.57	64.2	1.8
19.0	5.67	17.8	0.7	6.90	29.9	0.2	10.00	45.1	0.6	24.73	49.8	0.8	24.70	62.4	1.9
28.9	5.88	18.5	0.7	7.13	29.7	0.0	10.24	44.5	0.5	24.92	50.6	0.9	24.86	60.5	1.9
July 8.9	6.12	19.2	0.8	7.39	29.7	0.1	10.52	44.0	0.3	25.15	51.5	0.9	25.07	58.6	1.8
18.9	6.39	20.0	0.9	7.68	29.8	0.3	10.84	43.7	0.1	25.40	52.4	0.9	25.30	56.8	1.7
28.9	6.68	20.9	0.9	8.00	30.1	0.4	11.19	43.6	0.1	25.68	53.3	1.0	25.55	55.1	1.6
Aug. 7.8	6.98	21.8	0.9	8.34	30.5	0.5	11.55	43.7	0.2	25.97	54.3	0.9	25.82	53.5	1.3
17.8	7.29	22.7	0.9	8.69	31.0	0.6	11.93	43.9	0.4	26.27	55.2	0.8	26.10	52.2	1.1
27.8	7.61	23.6	0.7	9.05	31.6	0.6	12.32	44.3	0.6	26.58	56.0	0.7	26.40	51.1	0.8
Sept. 6.8	7.93	24.3	0.7	9.41	32.2	0.7	12.72	44.9	0.7	26.89	56.7	0.6	26.69	50.3	0.5
16.7	8.24	25.0	0.6	9.76	32.9	0.8	13.11	45.6	0.7	27.20	57.3	0.4	26.98	49.8	0.2
26.7	8.55	25.6	0.4	10.10	33.7	0.8	13.49	46.3	0.9	27.50	57.7	0.3	27.27	49.6	0.2
Oct. 6.7	8.84	26.0	0.3	10.44	34.5	0.7	13.86	47.2	1.0	27.80	58.0	0.1	27.55	49.8	0.6
16.6	9.12	26.3	0.3	10.76	35.2	0.8	14.21	48.2	1.1	28.08	58.1	0.0	27.82	50.4	0.8
26.6	9.38	26.6	0.1	11.06	36.0	0.9	14.54	49.3	1.1	28.35	58.1	0.1	28.07	51.2	1.1
Nov. 5.6	9.62	26.7	0.0	11.33	36.9	0.8	14.85	50.4	1.2	28.59	58.0	0.2	28.30	52.3	1.3
15.6	9.84	26.7	0.0	11.58	37.7	0.8	15.13	51.6	1.3	28.82	57.8	0.3	28.50	53.6	1.4
25.5	10.02	26.7	0.0	11.79	38.5	0.9	15.36	52.9	1.3	29.01	57.5	0.3	28.68	55.0	1.6
Dec. 5.5	10.17	26.7	0.1	11.96	39.4	0.8	15.56	54.2	1.3	29.17	57.2	0.3	28.82	56.6	1.5
15.5	10.28	26.6	0.0	12.09	40.2	0.8	15.70	55.5	1.3	29.29	56.9	0.3	28.93	58.1	1.5
25.5	10.35	26.6	0.1	12.17	41.0	0.8	15.79	56.8	1.2	29.37	56.6	0.2	29.00	59.6	1.4
35.4	10.37	26.5		12.20	41.8		15.82	58.0		29.40	56.4		29.02	61.0	

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Aurigæ. (Capella.)		$\beta$ Orionis. (Rigel.)		$\gamma$ Orionis.		$\delta$ Tauri.		$\chi$ Aurigæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 5 10	° ' " +45 54	h m 5 10	° ' " - 8 17	h m 5 13	° ' " - 6 56	h m 5 20	° ' " +28 31	h m 5 26	° ' " +32 7
	s	"	s	"	s	"	s	"	s	"
Jan. 0.4	2.74	32.8	13.13	78.5	14.57	28.0	36.40	60.1	52.48	38.8
10.4	2.75	34.3	13.13	80.0	14.57	29.4	36.43	60.6	52.51	39.5
20.4	2.69	35.6	13.09	81.3	14.53	30.7	36.40	61.1	52.49	40.2
30.4	2.58	36.7	13.00	82.4	14.45	31.7	36.33	61.5	52.42	40.8
Feb. 9.3	2.42	37.6	12.88	83.2	14.34	32.5	36.22	61.8	52.31	41.4
19.3	2.21	38.3	12.74	83.8	14.19	33.1	36.07	62.1	52.16	41.8
Mar. 1.3	1.98	38.6	12.57	84.2	14.03	33.5	35.90	62.3	51.98	42.0
11.3	1.74	38.6	12.40	84.3	13.86	33.6	35.71	62.3	51.78	42.1
21.2	1.49	38.4	12.22	84.1	13.68	33.5	35.52	62.2	51.58	42.0
31.2	1.26	37.8	12.05	83.7	13.51	33.1	35.34	62.0	51.40	41.8
Apr. 10.2	1.05	37.0	11.90	83.1	13.36	32.5	35.18	61.7	51.23	41.5
20.1	0.89	36.0	11.78	82.2	13.24	31.7	35.05	61.3	51.09	41.0
30.1	0.78	34.9	11.70	81.0	13.16	30.6	34.96	60.9	50.99	40.5
May 10.1	0.72	33.6	11.65	79.7	13.11	29.3	34.91	60.5	50.93	39.9
20.1	0.73	32.3	11.64	78.1	13.10	27.8	34.91	60.1	50.93	39.3
30.0	0.79	31.0	11.68	76.4	13.14	26.2	34.96	59.7	50.97	38.8
June 9.0	0.92	29.8	11.76	74.6	13.22	24.4	35.06	59.5	51.07	38.3
19.0	1.11	28.6	11.88	72.6	13.34	22.5	35.21	59.3	51.21	37.9
29.0	1.35	27.6	12.04	70.6	13.50	20.6	35.40	59.3	51.40	37.6
July 8.9	1.63	26.8	12.24	68.6	13.69	18.7	35.63	59.3	51.63	37.4
18.9	1.96	26.2	12.46	66.6	13.91	16.8	35.89	59.4	51.90	37.4
28.9	2.32	25.8	12.71	64.8	14.16	15.0	36.17	59.7	52.19	37.4
Aug. 7.8	2.70	25.5	12.98	63.1	14.42	13.4	36.48	60.0	52.50	37.5
17.8	3.10	25.4	13.26	61.7	14.70	12.0	36.81	60.3	52.84	37.7
27.8	3.52	25.6	13.55	60.6	14.99	10.9	37.14	60.7	53.18	38.0
Sept. 6.8	3.94	25.9	13.84	59.8	15.29	10.1	37.48	61.1	53.53	38.3
16.7	4.36	26.4	14.14	59.3	15.58	9.6	37.82	61.6	53.88	38.6
26.7	4.78	27.0	14.43	59.2	15.87	9.5	38.16	62.0	54.23	39.0
Oct. 6.7	5.19	27.8	14.71	59.5	16.15	9.7	38.49	62.4	54.58	39.4
16.7	5.58	28.8	14.98	60.1	16.42	10.3	38.82	62.8	54.92	39.9
26.6	5.95	29.9	15.23	61.0	16.68	11.2	39.12	63.2	55.24	40.3
Nov. 5.6	6.30	31.1	15.47	62.3	16.92	12.4	39.41	63.6	55.54	40.8
15.6	6.61	32.5	15.68	63.8	17.13	13.8	39.67	64.0	55.82	41.3
25.5	6.88	33.9	15.86	65.4	17.31	15.3	39.91	64.4	56.07	41.9
Dec. 5.5	7.10	35.4	16.01	67.1	17.46	17.0	40.11	64.8	56.28	42.6
15.5	7.27	37.0	16.12	68.8	17.58	18.6	40.27	65.2	56.45	43.2
25.5	7.38	38.5	16.18	70.4	17.65	20.3	40.38	65.7	56.57	43.9
35.4	7.43	40.0	16.21	72.0	17.68	21.8	40.44	66.2	56.64	44.6

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♌ Orionis.		Groombridge 966.		♈ Leporis.		♋ Orionis.		Groombridge 944.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	5 27	- 0 21	5 27	+74 58	5 28	-17 52	5 31	- 1 15	5 32	+85 9
Jan. 0.5	24.86	53.5	43.50	76.8	46.22	70.9	39.16	30.4	71.04	22.5
10.4	24.88	54.6	43.43	79.6	46.22	72.9	39.18	31.6	70.69	25.7
20.4	24.86	55.6	43.20	82.3	46.18	74.7	39.16	32.6	69.84	28.7
30.4	24.79	56.4	42.82	84.6	46.09	76.2	39.10	33.5	68.54	31.4
Feb. 9.3	24.69	57.1	42.31	86.6	45.97	77.4	39.00	34.2	66.83	33.6
19.3	24.56	57.6	41.69	88.1	45.82	78.3	38.87	34.8	64.80	35.3
Mar. 1.3	24.40	57.9	40.99	89.1	45.64	78.8	38.71	35.1	62.54	36.5
11.3	24.23	58.0	40.25	89.5	45.45	79.0	38.54	35.3	60.15	37.1
21.2	24.06	58.0	39.50	89.4	45.26	78.9	38.37	35.2	57.73	37.1
31.2	23.90	57.7	38.78	88.8	45.07	78.4	38.20	35.0	55.39	36.5
Apr. 10.2	23.75	57.3	38.12	87.7	44.90	77.7	38.05	34.5	53.23	35.3
20.2	23.62	56.7	37.56	86.1	44.76	76.6	37.92	33.9	51.32	33.7
30.1	23.53	56.0	37.11	84.1	44.65	75.2	37.83	33.1	49.75	31.6
May 10.1	23.48	55.0	36.80	81.9	44.57	73.5	37.77	32.1	48.58	29.1
20.1	23.47	53.9	36.63	79.5	44.54	71.6	37.75	31.0	47.83	26.4
30.0	23.50	52.7	36.62	76.9	44.55	69.6	37.78	29.7	47.54	23.6
June 9.0	23.57	51.3	36.76	74.3	44.60	67.3	37.85	28.3	47.72	20.7
19.0	23.68	49.8	37.05	71.8	44.70	65.0	37.96	26.8	48.36	17.8
29.0	23.83	48.2	37.49	69.4	44.84	62.6	38.10	25.2	49.44	15.0
July 8.9	24.02	46.6	38.06	67.2	45.01	60.2	38.29	23.6	50.93	12.4
18.9	24.23	45.1	38.75	65.2	45.22	57.9	38.50	22.0	52.79	10.1
28.9	24.47	43.6	39.54	63.5	45.45	55.7	38.73	20.5	54.99	8.0
Aug. 7.9	24.73	42.2	40.42	62.1	45.70	53.7	38.99	19.1	57.48	6.3
17.8	25.01	41.0	41.37	61.1	45.98	52.1	39.26	17.8	60.20	5.0
27.8	25.30	40.0	42.37	60.4	46.26	50.8	39.55	16.8	63.10	4.1
Sept. 6.8	25.59	39.3	43.41	60.1	46.56	49.9	39.84	16.1	66.14	3.7
16.7	25.88	38.8	44.46	60.3	46.86	49.4	40.13	15.7	69.24	3.7
26.7	26.18	38.7	45.51	60.8	47.15	49.3	40.43	15.5	72.35	4.1
Oct. 6.7	26.46	38.8	46.55	61.7	47.44	49.7	40.72	15.7	75.41	5.0
16.7	26.74	39.2	47.55	63.0	47.72	50.6	41.00	16.1	78.36	6.4
26.6	27.01	39.9	48.49	64.7	47.99	51.8	41.27	16.8	81.14	8.1
Nov. 5.6	27.26	40.9	49.35	66.8	48.24	53.4	41.52	17.8	83.68	10.3
15.6	27.49	42.0	50.12	69.1	48.46	55.3	41.75	19.0	85.91	12.9
25.6	27.69	43.2	50.78	71.7	48.66	57.4	41.96	20.3	87.79	15.7
Dec. 5.5	27.86	44.5	51.30	74.5	48.82	59.7	42.13	21.7	89.25	18.8
15.5	28.00	45.9	51.68	77.4	48.94	62.0	42.27	23.1	90.24	22.0
25.5	28.09	47.2	51.89	80.4	49.02	64.2	42.36	24.4	90.74	25.4
35.4	28.14	48.4	51.94	83.3	49.05	66.3	42.42	25.7	90.72	28.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Columbae.		κ Orionis.		δ Doradus.		ν Aurigae.		α Orionis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 5 36	° ' " 6	h m 5 43	° ' " 41	h m 5 44	° ' " 45	h m 5 45	° ' " 7	h m 5 50	° ' " 23
Jan. 0.5	24.35	79.5	29.76	62.9	39.83	71.3	15.54	27.4	18.31	29.6
10.4	24.33	82.2	29.79	64.6	39.64	74.5	15.60	28.5	18.36	28.9
20.4	24.26	84.6	29.77	66.1	39.37	77.4	15.59	29.6	18.36	28.2
30.4	24.14	86.6	29.70	67.4	39.01	79.9	15.53	30.6	18.32	27.6
Feb. 9.4	23.98	88.2	29.60	68.4	38.57	81.9	15.42	31.5	18.23	27.2
19.3	23.78	89.5	29.47	69.2	38.08	83.5	15.26	32.2	18.11	26.9
Mar. 1.3	23.56	90.3	29.31	69.7	37.54	84.5	15.07	32.7	17.96	26.8
11.3	23.33	90.6	29.13	70.0	36.97	85.0	14.86	33.0	17.80	26.7
21.2	23.09	90.5	28.95	69.9	36.40	84.9	14.64	33.1	17.63	26.7
31.2	22.85	89.9	28.78	69.6	35.84	84.3	14.43	32.9	17.46	26.8
Apr. 10.2	22.64	88.9	28.61	69.1	35.31	83.2	14.23	32.5	17.31	27.1
20.2	22.45	87.5	28.47	68.3	34.81	81.6	14.06	32.0	17.18	27.4
30.1	22.29	85.7	28.36	67.3	34.37	79.5	13.94	31.3	17.07	27.9
May 10.1	22.17	83.6	28.29	66.0	34.00	77.0	13.86	30.5	17.00	28.4
20.1	22.10	81.2	28.26	64.5	33.70	74.2	13.83	29.6	16.98	29.1
30.1	22.08	78.6	28.26	62.8	33.49	71.1	13.86	28.7	16.99	29.9
Jun. 9.0	22.10	75.7	28.31	61.0	33.37	67.7	13.94	27.8	17.05	30.8
19.0	22.17	72.8	28.40	59.1	33.34	64.3	14.07	26.9	17.15	31.8
29.0	22.29	69.8	28.53	57.1	33.40	60.8	14.25	26.1	17.29	32.8
July 8.9	22.45	66.8	28.70	55.1	33.55	57.3	14.48	25.5	17.46	33.9
18.9	22.65	64.0	28.90	53.1	33.79	54.0	14.74	24.9	17.67	35.0
28.9	22.88	61.3	29.12	51.3	34.10	50.9	15.04	24.4	17.90	36.1
Aug. 7.9	23.14	59.0	29.36	49.6	34.49	48.2	15.37	24.1	18.15	37.1
17.8	23.43	57.0	29.63	48.2	34.94	45.8	15.71	23.9	18.42	38.0
27.8	23.73	55.4	29.90	47.0	35.44	44.0	16.08	23.8	18.70	38.7
Sept. 6.8	24.05	54.3	30.19	46.1	35.98	42.8	16.46	23.8	19.00	39.3
16.8	24.37	53.8	30.48	45.6	36.54	42.2	16.84	24.0	19.30	39.7
26.7	24.70	53.8	30.78	45.5	37.11	42.2	17.22	24.2	19.60	39.8
Oct. 6.7	25.02	54.4	31.07	45.8	37.67	42.9	17.60	24.5	19.90	39.7
16.7	25.32	55.5	31.36	46.5	38.20	44.2	17.98	24.9	20.19	39.4
26.6	25.61	57.1	31.63	47.5	38.69	46.1	18.34	25.4	20.48	38.9
Nov. 5.6	25.88	59.2	31.89	48.8	39.12	48.6	18.68	26.1	20.75	38.2
15.6	26.12	61.6	32.12	50.3	39.49	51.5	19.00	26.8	21.00	37.3
25.6	26.32	64.3	32.33	52.1	39.77	54.7	19.29	27.6	21.23	36.4
Dec. 5.5	26.48	67.2	32.51	54.0	39.95	58.1	19.54	28.5	21.43	35.5
15.5	26.60	70.2	32.65	55.9	40.04	61.7	19.74	29.5	21.59	34.5
25.5	26.66	73.1	32.75	57.7	40.02	65.2	19.89	30.6	21.72	33.6
35.5	26.67	75.9	32.81	59.5	39.90	68.5	19.99	31.7	21.80	32.8



## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Aurigæ.		$\theta$ Aurigæ.		$\nu$ Orionis.		$\alpha$ Camelop. (H.).		$\gamma$ Geminorum.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m	° ' "	h m	° ' "	h m	° ' "	h m	° ' "	h m	° ' "
	5 52	+44 56	5 53	+37 12	6 2	+14 46	6 8	+69 21	6 9	+22 32
	s	"	s	"	s	"	s	"	s	"
Jan. 0.5	56.20	26.0	35.48	29.7	26.38	50.4	57.75	15.3	27.11	4.1
10.4	56.27 .07	27.4 1.4	35.55 .07	30.7 1.0	26.45 .07	50.0 0.4	57.85 .10	18.0 2.7	27.19 .08	4.2 0.1
20.4	56.27 .00	28.8 1.4	35.56 .01	31.7 1.0	26.46 .01	49.8 0.2	57.81 .04	20.6 2.6	27.21 .02	4.4 0.2
30.4	56.20 .07	30.1 1.3	35.51 .05	32.7 1.0	26.43 .03	49.6 0.2	57.65 .16	23.0 2.4	27.19 .02	4.6 0.2
Feb. 9.4	56.08 .12	31.3 1.2	35.41 .10	32.7 0.8	26.36 .07	49.5 0.1	57.38 .27	25.2 2.2	27.11 .08	4.9 0.3
	56.08 .17	31.3 0.9	35.41 .15	33.5 0.7	26.36 .11	49.5 0.1	57.38 .38	25.2 1.8	27.11 .11	4.9 0.2
Mar. 19.3	55.91 .21	32.2 0.7	35.26 .18	34.2 0.6	26.25 .15	49.4 0.0	57.00 .45	27.0 1.4	27.00 .15	5.1 0.2
1.3	55.70 .23	32.9 0.5	35.08 .20	34.8 0.3	26.10 .16	49.4 0.0	56.55 .50	28.4 0.9	26.85 .17	5.3 0.2
11.3	55.47 .24	33.4 0.1	34.88 .22	35.1 0.1	25.94 .18	49.4 0.1	56.05 .53	29.3 0.4	26.68 .17	5.5 0.2
21.3	55.23 .24	33.5 0.1	34.66 .21	35.2 0.1	25.76 .17	49.5 0.1	55.52 .52	29.7 0.1	26.51 .18	5.7 0.1
31.2	54.99 .22	33.4 0.4	34.45 .19	35.1 0.3	25.59 .16	49.6 0.1	55.00 .51	29.6 0.6	26.33 .17	5.8 0.0
Apr. 10.2	54.77 .19	33.0 0.7	34.26 .16	34.8 0.4	25.43 .14	49.7 0.2	54.49 .45	29.0 1.0	26.16 .15	5.8 0.0
20.2	54.58 .15	32.3 0.9	34.10 .13	34.4 0.6	25.29 .11	49.9 0.2	54.04 .38	28.0 1.5	26.01 .11	5.8 0.1
30.1	54.43 .10	31.4 1.0	33.97 .08	33.8 0.7	25.18 .07	50.1 0.2	53.66 .29	26.5 1.7	25.90 .08	5.7 0.0
May 10.1	54.33 .04	30.4 1.2	33.89 .04	33.1 0.8	25.11 .03	50.3 0.3	53.37 .19	24.8 2.1	25.82 .04	5.7 0.1
20.1	54.29 .01	29.2 1.2	33.85 .02	32.3 0.8	25.08 .01	50.6 0.4	53.18 .08	22.7 2.2	25.78 .00	5.6 0.0
June 30.1	54.30 .07	28.0 1.2	33.87 .07	31.5 0.8	25.09 .05	51.0 0.5	53.10 .02	20.5 2.4	25.78 .05	5.6 0.0
9.0	54.37 .13	26.8 1.2	33.94 .12	30.7 0.8	25.14 .09	51.5 0.5	53.12 .14	18.1 2.4	25.83 .09	5.6 0.0
19.0	54.50 .19	25.6 1.1	34.06 .17	29.9 0.7	25.23 .14	52.0 0.6	53.26 .25	15.7 2.4	25.92 .14	5.6 0.1
29.0	54.69 .23	24.5 1.0	34.23 .21	29.2 0.6	25.37 .17	52.6 0.6	53.51 .35	13.3 2.3	26.06 .17	5.7 0.2
July 9.0	54.92 .28	23.5 0.9	34.44 .25	28.6 0.5	25.54 .20	53.2 0.7	53.86 .44	11.0 2.1	26.23 .21	5.9 0.2
Aug. 18.9	55.20 .31	22.6 0.8	34.69 .29	28.1 0.5	25.74 .23	53.9 0.6	54.30 .53	8.9 2.0	26.44 .23	6.1 0.2
28.9	55.51 .35	21.8 0.7	34.98 .31	27.6 0.3	25.97 .25	54.5 0.7	54.83 .60	6.9 1.7	26.67 .26	6.3 0.2
7.9	55.86 .37	21.1 0.5	35.29 .34	27.3 0.2	26.22 .27	55.2 0.5	55.43 .66	5.2 1.5	26.93 .28	6.5 0.3
17.8	56.23 .39	20.6 0.3	35.63 .35	27.1 0.1	26.49 .29	55.7 0.5	56.09 .71	3.7 1.1	27.21 .30	6.8 0.2
27.8	56.62 .41	20.3 0.2	35.98 .36	27.0 0.1	26.78 .30	56.2 0.4	56.80 .75	2.6 0.8	27.51 .31	7.0 0.1
Sept. 6.8	57.03 .41	20.1 0.0	36.34 .38	26.9 0.1	27.08 .31	56.6 0.2	57.55 .78	1.8 0.5	27.82 .32	7.1 0.1
16.8	57.44 .42	20.1 0.1	36.72 .37	27.0 0.1	27.39 .31	56.8 0.0	58.33 .79	1.3 0.2	28.14 .33	7.2 0.0
26.7	57.86 .42	20.2 0.3	37.09 .38	27.1 0.2	27.70 .31	56.8 0.0	59.12 .80	1.1 0.3	28.47 .33	7.2 0.1
Oct. 6.7	58.28 .41	20.5 0.5	37.47 .37	27.3 0.3	28.01 .31	56.8 0.3	59.92 .79	1.4 0.6	28.80 .32	7.1 0.2
16.7	58.69 .40	21.0 0.6	37.84 .36	27.6 0.3	28.32 .30	56.5 0.3	60.71 .76	2.0 0.9	29.12 .32	6.9 0.1
Nov. 26.7	59.09 .38	21.6 0.7	38.20 .34	27.9 0.5	28.62 .29	56.2 0.5	61.47 .73	2.9 1.3	29.44 .31	6.8 0.3
5.6	59.47 .35	22.3 0.9	38.54 .32	28.4 0.6	28.91 .27	55.7 0.5	62.20 .67	4.2 1.7	29.75 .29	6.5 0.2
15.6	59.82 .32	23.2 1.1	38.86 .29	29.0 0.6	29.18 .25	55.2 0.6	62.87 .60	5.9 2.0	30.04 .26	6.3 0.2
25.6	60.14 .27	24.3 1.2	39.15 .25	29.6 0.8	29.43 .21	54.6 0.6	63.47 .51	7.9 2.2	30.30 .24	6.1 0.2
Dec. 5.5	60.41 .23	25.5 1.3	39.40 .21	30.4 0.8	29.64 .19	54.0 0.6	63.98 .42	10.1 2.5	30.54 .20	5.9 0.1
15.5	60.64 .17	26.8 1.4	39.61 .16	31.2 0.9	29.83 .14	53.4 0.5	64.40 .30	12.6 2.6	30.74 .16	5.8 0.1
25.5	60.81 .11	28.2 1.5	39.77 .10	32.1 1.0	29.97 .09	52.9 0.4	64.70 .18	15.2 2.7	30.90 .11	5.7 0.1
35.5	60.92 .11	29.7 1.5	39.87 .10	33.1 1.0	30.06 .09	52.5 0.4	64.88 .18	17.9 2.7	31.01 .11	5.8 0.1

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\mu$ Geminorum.		$\psi^2$ Aurigæ.		$\alpha$ Argûs. (Canopus.)		$\nu$ Geminorum.		$\gamma$ Geminorum.											
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.										
	<sup>h</sup> <sup>m</sup> 6 17	<sup>°</sup> +22 33	<sup>h</sup> <sup>m</sup> 6 17	<sup>°</sup> +49 20	<sup>h</sup> <sup>m</sup> 6 21	<sup>°</sup> -52 38	<sup>h</sup> <sup>m</sup> 6 23	<sup>°</sup> +20 16	<sup>h</sup> <sup>m</sup> 6 32	<sup>°</sup> +16 28										
	<sup>s</sup>	<sup>"</sup>	<sup>s</sup>	<sup>"</sup>	<sup>s</sup>	<sup>"</sup>	<sup>s</sup>	<sup>"</sup>	<sup>s</sup>	<sup>"</sup>										
Jan. 0.5	31.35	.09	41.1	0.0	58.86	.10	9.3	1.7	59.05	.02	44.6	3.4	37.54	.09	14.4	0.0	31.18	.09	39.3	0.4
10.5	31.44	.03	41.1	0.2	58.96	.10	11.0	1.7	59.03	.10	48.0	3.1	37.63	.04	14.4	0.0	31.27	.09	38.9	0.2
20.4	31.47	.02	41.3	0.2	58.99	.03	12.7	1.6	58.93	.15	51.1	2.8	37.67	.01	14.4	0.1	31.32	.01	38.7	0.1
30.4	31.45	.07	41.5	0.3	58.95	.11	14.3	1.5	58.78	.22	53.9	2.4	37.66	.06	14.5	0.1	31.31	.05	38.6	0.0
Feb. 9.4	31.38	.10	41.8	0.2	58.84	.16	15.8	1.3	58.56	.27	56.3	2.0	37.60	.10	14.6	0.2	31.26	.10	38.6	0.0
19.4	31.28	.14	42.0	0.3	58.68	.21	17.1	1.0	58.29	.32	58.3	1.5	37.50	.14	14.8	0.2	31.16	.13	38.6	0.1
Mar. 1.3	31.14	.17	42.3	0.2	58.47	.25	18.1	0.7	57.97	.34	59.8	1.0	37.36	.16	15.0	0.2	31.03	.15	38.7	0.1
11.3	30.97	.18	42.5	0.2	58.22	.26	18.8	0.4	57.63	.35	60.8	0.5	37.20	.18	15.2	0.2	30.88	.17	38.8	0.2
21.3	30.79	.18	42.7	0.1	57.96	.26	19.2	0.1	57.28	.36	61.3	0.0	37.02	.17	15.4	0.1	30.71	.17	39.0	0.2
31.2	30.61	.17	42.8	0.1	57.70	.25	19.3	0.3	56.92	.35	61.3	0.6	36.85	.17	15.5	0.1	30.54	.17	39.2	0.1
Apr. 10.2	30.44	.15	42.9	0.0	57.45	.23	19.0	0.6	56.57	.33	60.7	1.1	36.68	.15	15.6	0.1	30.37	.15	39.3	0.2
20.2	30.29	.12	42.9	0.1	57.22	.18	18.4	0.8	56.24	.30	59.6	1.5	36.53	.12	15.7	0.1	30.22	.12	39.5	0.2
30.2	30.17	.08	42.8	0.0	57.04	.14	17.6	1.0	55.94	.25	58.1	2.0	36.41	.09	15.8	0.0	30.10	.09	39.7	0.2
May 10.1	30.09	.05	42.8	0.1	56.90	.08	16.6	1.3	55.69	.20	56.1	2.4	36.32	.05	15.8	0.1	30.01	.06	39.9	0.2
20.1	30.04	.00	42.7	0.0	56.82	.02	15.3	1.3	55.49	.15	53.7	2.7	36.27	.01	15.9	0.1	29.95	.01	40.1	0.3
30.1	30.04	.04	42.7	0.0	56.80	.04	14.0	1.5	55.34	.09	51.0	3.0	36.26	.04	16.0	0.1	29.94	.02	40.4	0.3
June 9.1	30.08	.08	42.7	0.0	56.84	.10	12.5	1.5	55.25	.03	48.0	3.2	36.30	.07	16.1	0.2	29.96	.07	40.7	0.4
19.0	30.16	.13	42.7	0.1	56.94	.16	11.0	1.4	55.22	.03	44.8	3.3	36.37	.12	16.3	0.2	30.03	.11	41.1	0.4
29.0	30.29	.17	42.8	0.1	57.10	.21	9.6	1.4	55.25	.09	41.5	3.3	36.49	.16	16.5	0.2	30.14	.14	41.5	0.4
July 9.0	30.46	.20	42.9	0.2	57.31	.26	8.2	1.3	55.34	.15	38.2	3.3	36.65	.19	16.7	0.2	30.28	.18	41.9	0.4
18.9	30.66	.23	43.1	0.1	57.57	.31	6.9	1.2	55.49	.20	34.9	3.1	36.84	.22	16.9	0.3	30.46	.21	42.3	0.4
28.9	30.89	.25	43.2	0.2	57.88	.35	5.7	1.1	55.69	.25	31.8	2.9	37.06	.25	17.2	0.3	30.67	.23	42.7	0.4
Aug. 7.9	31.14	.28	43.4	0.2	58.23	.38	4.6	0.9	55.94	.30	28.9	2.5	37.31	.27	17.5	0.2	30.90	.25	43.1	0.3
17.9	31.42	.29	43.6	0.1	58.61	.40	3.7	0.7	56.24	.34	26.4	2.0	37.58	.28	17.7	0.1	31.15	.28	43.4	0.3
27.8	31.71	.31	43.7	0.1	59.01	.43	3.0	0.6	56.58	.37	24.4	1.6	37.86	.30	17.8	0.1	31.43	.29	43.7	0.1
Sept. 6.8	32.02	.32	43.8	0.0	59.44	.44	2.4	0.4	56.95	.39	22.8	1.0	38.16	.31	17.9	0.1	31.72	.30	43.8	0.0
16.8	32.34	.32	43.8	0.1	59.88	.45	2.0	0.2	57.34	.41	21.8	0.4	38.47	.32	18.0	0.1	32.02	.31	43.8	0.1
26.8	32.66	.33	43.7	0.1	60.33	.45	1.8	0.0	57.75	.41	21.4	0.3	38.79	.32	17.9	0.2	32.33	.32	43.7	0.2
Oct. 6.7	32.99	.33	43.6	0.2	60.78	.46	1.8	0.2	58.16	.41	21.7	0.9	39.11	.33	17.7	0.3	32.65	.32	43.5	0.4
16.7	33.32	.32	43.4	0.3	61.24	.44	2.0	0.4	58.57	.39	22.6	1.5	39.44	.32	17.4	0.4	32.97	.31	43.1	0.5
26.7	33.64	.31	43.1	0.3	61.68	.43	2.4	0.6	58.96	.36	24.1	2.1	39.76	.31	17.0	0.4	33.28	.31	42.6	0.6
Nov. 5.6	33.95	.30	42.8	0.3	62.11	.40	3.0	0.9	59.32	.33	26.2	2.6	40.07	.30	16.6	0.4	33.59	.29	42.0	0.6
15.6	34.25	.27	42.5	0.2	62.51	.37	3.9	1.0	59.65	.28	28.8	2.9	40.37	.27	16.2	0.4	33.88	.27	41.4	0.7
25.6	34.52	.25	42.3	0.2	62.88	.33	4.9	1.3	59.93	.23	31.7	3.3	40.64	.25	15.8	0.4	34.15	.25	40.7	0.6
Dec. 5.6	34.77	.21	42.1	0.2	63.21	.28	6.2	1.4	60.16	.17	35.0	3.5	40.89	.21	15.4	0.3	34.40	.22	40.1	0.6
15.5	34.98	.16	41.9	0.1	63.49	.21	7.6	1.5	60.33	.09	38.5	3.5	41.10	.17	15.1	0.2	34.62	.17	39.5	0.5
25.5	35.14	.12	41.8	0.0	63.70	.15	9.1	1.7	60.42	.03	42.0	3.5	41.27	.12	14.9	0.2	34.79	.13	39.0	0.4
35.5	35.26		41.8	0.0	63.85		10.8	1.7	60.45		45.5	3.5	41.39		14.7		34.92		38.6	

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

345

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Geminorum.		ψ <sup>5</sup> Aurigæ.		α Canis Majoris. (Sirius.)		θ Geminorum.		ζ Mensæ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 6 38	° ' " +25 13	h m 6 40	° ' " +43 40	h m 6 41	° ' " -16 35	h m 6 46	° ' " +34. 4	h m 6 47	° ' " -80 42
Jan. 0.5	24.15	18.5	15.92	7.3	11.40	28.4	52.01	16.8	42.75	64.8
10.5	24.26	18.7	16.05	8.7	11.47	30.7	52.14	17.5	42.44	68.3
20.5	24.31	19.0	16.11	10.1	11.50	32.8	52.21	18.4	41.88	71.6
30.4	24.31	19.4	16.11	11.5	11.47	34.7	52.22	19.2	41.09	74.7
Feb. 9.4	24.26	19.8	16.04	12.8	11.40	36.3	52.17	20.1	40.08	77.5
19.4	24.17	20.3	15.92	14.0	11.29	37.6	52.07	20.9	38.89	79.9
Mar. 1.3	24.04	20.7	15.75	15.0	11.14	38.6	51.93	21.7	37.56	81.8
11.3	23.88	21.0	15.54	15.8	10.97	39.3	51.76	22.3	36.11	83.3
21.3	23.70	21.3	15.32	16.4	10.79	39.7	51.57	22.8	34.60	84.2
31.3	23.52	21.6	15.08	16.6	10.60	39.7	51.37	23.1	33.06	84.7
Apr. 10.2	23.34	21.7	14.86	16.6	10.41	39.4	51.17	23.2	31.52	84.6
20.2	23.18	21.7	14.65	16.4	10.24	38.8	50.99	23.1	30.02	84.0
30.2	23.04	21.7	14.47	15.9	10.09	37.9	50.84	22.9	28.60	82.9
May 10.1	22.94	21.6	14.34	15.2	9.97	36.7	50.72	22.5	27.28	81.3
20.1	22.88	21.4	14.25	14.3	9.89	35.3	50.64	22.0	26.11	79.3
30.1	22.86	21.3	14.21	13.2	9.84	33.7	50.61	21.5	25.10	76.9
June 9.1	22.88	21.1	14.23	12.1	9.83	31.9	50.63	20.9	24.28	74.2
19.0	22.95	21.0	14.30	10.9	9.86	29.9	50.69	20.2	23.66	71.2
29.0	23.06	20.8	14.42	9.7	9.93	27.8	50.80	19.5	23.26	68.0
July 9.0	23.21	20.7	14.59	8.6	10.03	25.7	50.95	18.8	23.09	64.8
19.0	23.39	20.6	14.81	7.4	10.17	23.5	51.14	18.2	23.15	61.5
28.9	23.61	20.5	15.07	6.3	10.34	21.5	51.36	17.6	23.45	58.2
Aug. 7.9	23.85	20.4	15.36	5.3	10.54	19.7	51.62	17.0	23.97	55.2
17.9	24.12	20.3	15.69	4.4	10.77	18.0	51.90	16.4	24.70	52.5
27.9	24.41	20.2	16.04	3.6	11.01	16.7	52.21	15.9	25.61	50.1
Sept. 6.8	24.71	20.1	16.42	2.9	11.28	15.7	52.54	15.5	26.69	48.2
16.8	25.02	19.9	16.81	2.4	11.56	15.0	52.88	15.0	27.90	46.8
26.8	25.35	19.6	17.21	1.9	11.85	14.8	53.23	14.6	29.19	46.0
Oct. 6.7	25.69	19.3	17.63	1.6	12.15	15.1	53.60	14.2	30.53	45.9
16.7	26.03	19.0	18.04	1.5	12.45	15.8	53.96	13.9	31.86	46.4
26.7	26.36	18.7	18.46	1.5	12.75	16.9	54.33	13.6	33.14	47.6
Nov. 5.7	26.69	18.3	18.86	1.7	13.04	18.4	54.69	13.4	34.32	49.3
15.6	27.01	18.0	19.25	2.0	13.31	20.3	55.04	13.3	35.36	51.6
25.6	27.30	17.7	19.61	2.6	13.56	22.4	55.37	13.4	36.20	54.4
Dec. 5.6	27.57	17.5	19.94	3.4	13.79	24.7	55.67	13.6	36.83	57.5
15.6	27.81	17.4	20.22	4.3	13.98	27.1	55.93	14.0	37.22	60.9
25.5	28.00	17.4	20.45	5.5	14.13	29.5	56.15	14.5	37.34	64.4
35.5	28.14	17.5	20.62	6.7	14.24	31.9	56.31	15.1	37.20	68.0

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Canis Majoris.		ζ Geminorum.		δ Canis Majoris.		63 Aurigæ.		γ Volantis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 6 55	° ' " -28 50	h m 6 58	° ' " +20 42	h m 7 4	° ' " -26 14	h m 7 5	° ' " +39 28	h m 7 9	° ' " -70 20
Jan. 0.5	6.12	52.4	46.72	13.5	44.60	54.5	28.61	7.6	34.75	63.1
10.5	6.20	55.2	46.84	13.4	44.69	57.3	28.77	8.6	34.73	66.8
20.5	6.22	57.9	46.92	13.4	44.73	59.9	28.86	9.7	34.59	70.3
30.4	6.18	60.3	46.94	13.5	44.71	62.3	28.89	10.9	34.32	73.7
Feb. 9.4	6.10	62.5	46.91	13.7	44.64	64.4	28.86	12.1	33.94	76.7
19.4	5.98	64.3	46.83	14.0	44.53	66.2	28.77	13.2	33.47	79.4
Mar. 1.4	5.81	65.7	46.72	14.3	44.38	67.6	28.63	14.3	32.91	81.7
11.3	5.62	66.7	46.57	14.6	44.20	68.6	28.46	15.1	32.29	83.5
21.3	5.41	67.3	46.41	14.9	44.00	69.3	28.26	15.8	31.62	84.7
31.3	5.20	67.5	46.23	15.1	43.80	69.5	28.04	16.3	30.92	85.5
Apr. 10.2	4.98	67.3	46.06	15.3	43.59	69.4	27.83	16.5	30.23	85.7
20.2	4.78	66.7	45.90	15.5	43.40	68.9	27.63	16.5	29.54	85.4
30.2	4.60	65.7	45.76	15.7	43.22	68.0	27.46	16.3	28.89	84.5
May 10.2	4.45	64.4	45.65	15.8	43.07	66.8	27.32	15.8	28.29	83.2
20.1	4.33	62.7	45.58	15.9	42.95	65.2	27.22	15.2	27.75	81.4
30.1	4.24	60.7	45.54	15.9	42.87	63.4	27.16	14.4	27.28	79.2
June 9.1	4.20	58.5	45.55	16.0	42.82	61.3	27.16	13.6	26.90	76.5
19.1	4.20	56.1	45.60	16.1	42.82	59.0	27.20	12.6	26.62	73.6
29.0	4.24	53.5	45.68	16.2	42.85	56.6	27.29	11.6	26.44	70.5
July 9.0	4.32	50.9	45.80	16.2	42.93	54.1	27.42	10.6	26.36	67.2
19.0	4.44	48.3	45.96	16.3	43.04	51.6	27.60	9.6	26.40	63.8
29.0	4.60	45.8	46.15	16.4	43.18	49.2	27.82	8.6	26.54	60.5
Aug. 7.9	4.79	43.4	46.37	16.4	43.36	46.9	28.07	7.6	26.79	57.4
17.9	5.00	41.3	46.61	16.4	43.57	44.8	28.36	6.6	27.14	54.5
27.9	5.25	39.5	46.88	16.3	43.81	43.1	28.67	5.7	27.58	51.9
Sept. 6.8	5.52	38.1	47.16	16.2	44.07	41.7	29.00	4.9	28.10	49.8
16.8	5.81	37.1	47.46	16.0	44.35	40.8	29.36	4.1	28.69	48.2
26.8	6.11	36.7	47.77	15.6	44.64	40.4	29.73	3.4	29.33	47.2
Oct. 6.8	6.43	36.8	48.09	15.2	44.95	40.4	30.12	2.8	30.00	46.8
16.7	6.75	37.4	48.42	14.7	45.27	41.0	30.51	2.3	30.68	47.1
26.7	7.06	38.6	48.75	14.1	45.58	42.1	30.91	2.0	31.36	48.0
Nov. 5.7	7.37	40.2	49.08	13.4	45.89	43.7	31.30	1.8	32.00	49.6
15.7	7.67	42.3	49.40	12.8	46.19	45.7	31.68	1.7	32.59	51.8
25.6	7.94	44.7	49.70	12.2	46.47	48.0	32.04	1.8	33.10	54.5
Dec. 5.6	8.18	47.4	49.98	11.6	46.72	50.6	32.38	2.2	33.52	57.6
15.6	8.38	50.3	50.22	11.1	46.93	53.4	32.68	2.7	33.83	61.1
25.5	8.54	53.2	50.42	10.7	47.10	56.2	32.93	3.4	34.02	64.7
35.5	8.65	56.1	50.58	10.5	47.22	59.1	33.12	4.3	34.09	68.4

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	25 Camelop. (H.).			δ Geminorum.			Piazzi vii, 67.			β Canis Minoris.			α² Geminorum. (Castor.)		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	7 12		+82 34	7 14		+22 8	7 21		+68 38	7 22		+ 8 28	7 28		+32 5
Jan. 0.5	19.54	0.55	76.1	45.38	58.0	33.55	63.3	16.64	19.9	52.02	14.5				
10.5	20.09	0.21	79.2	45.52	57.9	33.83	65.8	16.77	18.9	52.20	15.0				
20.5	20.30	0.14	82.3	45.61	58.0	33.99	68.4	16.86	18.1	52.31	15.6				
30.5	20.16	0.47	85.4	45.65	58.2	34.02	71.0	16.90	17.4	52.37	16.4				
Feb. 9.4	19.69	0.78	88.3	45.63	58.4	33.93	73.6	16.89	16.9	52.36	17.2				
19.4	18.91	1.05	90.9	45.57	58.8	33.72	75.9	16.83	16.6	52.31	18.1				
Mar. 1.4	17.86	1.26	93.2	45.46	59.2	33.40	78.0	16.73	16.4	52.20	18.9				
11.3	16.60	1.42	95.0	45.33	59.6	33.01	79.7	16.61	16.4	52.06	19.7				
21.3	15.18	1.50	96.3	45.17	59.9	32.55	81.0	16.46	16.4	51.89	20.4				
31.3	13.68	1.52	97.0	44.99	60.3	32.06	81.8	16.30	16.6	51.71	20.9				
Apr. 10.3	12.16	1.48	97.1	44.82	60.6	31.56	82.1	16.13	16.8	51.52	21.3				
20.2	10.68	1.37	96.7	44.65	60.8	31.08	81.9	15.98	17.2	51.33	21.5				
30.2	9.31	1.21	95.7	44.51	61.0	30.63	81.3	15.84	17.6	51.17	21.6				
May 10.2	8.10	1.01	94.2	44.39	61.1	30.24	80.2	15.73	18.0	51.03	21.5				
20.2	7.09	0.77	92.3	44.31	61.1	29.93	78.7	15.64	18.5	50.93	21.3				
30.1	6.32	0.51	90.0	44.26	61.1	29.70	76.9	15.59	19.1	50.86	20.9				
June 9.1	5.81	0.23	87.4	44.26	61.1	29.56	74.8	15.57	19.8	50.84	20.4				
19.1	5.58	0.06	84.6	44.29	61.1	29.52	72.5	15.59	20.5	50.86	19.8				
29.0	5.64	0.35	81.6	44.36	61.1	29.58	70.0	15.65	21.2	50.92	19.2				
July 9.0	5.99	0.62	78.6	44.47	61.0	29.74	67.5	15.74	21.9	51.02	18.6				
19.0	6.61	0.88	75.6	44.61	61.0	30.00	65.0	15.86	22.6	51.16	17.9				
29.0	7.49	1.13	72.7	44.79	60.9	30.35	62.5	16.01	23.3	51.34	17.1				
Aug. 7.9	8.62	1.35	70.0	44.99	60.8	30.78	60.1	16.19	23.9	51.55	16.4				
17.9	9.97	1.55	67.5	45.22	60.6	31.29	57.8	16.40	24.4	51.79	15.7				
27.9	11.52	1.72	65.2	45.48	60.4	31.86	55.7	16.63	24.7	52.05	14.9				
Sept. 6.9	13.24	1.86	63.2	45.75	60.1	32.49	53.9	16.88	24.9	52.34	14.1				
16.8	15.10	1.97	61.6	46.05	59.7	33.18	52.4	17.15	24.9	52.65	13.3				
26.8	17.07	2.05	60.5	46.36	59.2	33.91	51.1	17.44	24.6	52.98	12.5				
Oct. 6.8	19.12	2.08	59.7	46.68	58.6	34.66	50.2	17.74	24.2	53.33	11.7				
16.7	21.20	2.08	59.4	47.01	58.0	35.44	49.6	18.04	23.5	53.69	10.9				
26.7	23.28	2.03	59.5	47.35	57.3	36.22	49.4	18.36	22.6	54.06	10.2				
Nov. 5.7	25.31	1.94	60.1	47.68	56.6	36.99	49.6	18.67	21.6	54.43	9.6				
15.7	27.25	1.80	61.2	48.01	55.9	37.74	50.3	18.98	20.4	54.79	9.0				
25.6	29.05	1.60	62.8	48.33	55.2	38.45	51.3	19.27	19.2	55.14	8.6				
Dec. 5.6	30.65	1.36	64.9	48.62	54.6	39.10	52.8	19.55	17.9	55.46	8.4				
15.6	32.01	1.09	67.3	48.88	54.1	39.67	54.6	19.79	16.6	55.76	8.4				
25.6	33.10	0.78	70.0	49.10	53.7	40.15	56.7	20.00	15.4	56.01	8.5				
35.5	33.88		72.9	49.28	53.5	40.51	59.1	20.17	14.3	56.22	8.8				

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>α</i> Canis Minoris. (Procyon.)		<i>β</i> Geminorum. (Pollux.)		<i>φ</i> Geminorum.		<i>26</i> Lyncis.		Groombridge 1374.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 7 34	° + 5 27	h m 7 39	° + 28 14	h m 7 47	° + 26 59	h m 7 48	° + 47 47	h m 7 49	° + 74 9
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 0.6	35.80	24.8	49.05	41.0	59.89	59.8	10.58	55.5	29.47	33.7
	.15	1.2	.18	0.2	.19	0.0	.23	1.3	0.44	2.6
10.5	35.95	23.6	49.23	41.2	60.08	59.8	10.81	56.8	29.91	36.3
	.09	1.1	.12	0.4	.13	0.3	.16	1.5	0.28	2.8
20.5	36.04	22.5	49.35	41.6	60.21	60.1	10.97	58.3	30.19	39.1
	.05	0.9	.06	0.5	.07	0.4	.08	1.7	0.11	2.8
30.5	36.09	21.6	49.41	42.1	60.28	60.5	11.05	60.0	30.30	41.9
	.00	0.7	.01	0.6	.02	0.6	.02	1.6	0.06	2.8
Feb. 9.4	36.09	20.9	49.42	42.7	60.30	61.1	11.07	61.6	30.24	44.7
	.05	0.6	.04	0.7	.03	0.6	.06	1.7	0.22	2.7
19.4	36.04	20.3	49.38	43.4	60.27	61.7	11.01	63.3	30.02	47.4
	.09	0.3	.09	0.7	.09	0.7	.12	1.6	0.36	2.4
Mar. 1.4	35.95	20.0	49.29	44.1	60.18	62.4	10.89	64.9	29.66	49.8
	.12	0.2	.13	0.7	.12	0.7	.17	1.4	0.48	2.1
11.4	35.83	19.8	49.16	44.8	60.06	63.1	10.72	66.3	29.18	51.9
	.15	0.1	.16	0.6	.15	0.6	.21	1.2	0.58	1.6
21.3	35.68	19.7	49.00	45.4	59.91	63.7	10.51	67.5	28.60	53.5
	.16	0.1	.18	0.6	.17	0.6	.23	0.9	0.64	1.2
31.3	35.52	19.8	48.82	46.0	59.74	64.3	10.28	68.4	27.96	54.7
	.16	0.2	.18	0.4	.17	0.4	.24	0.6	0.67	0.6
Apr. 10.3	35.36	20.0	48.64	46.4	59.57	64.7	10.04	69.0	27.29	55.3
	.16	0.4	.17	0.3	.17	0.4	.24	0.3	0.68	0.1
20.3	35.20	20.4	48.47	46.7	59.40	65.1	9.80	69.3	26.61	55.4
	.14	0.4	.16	0.2	.16	0.2	.22	0.0	0.64	0.4
30.2	35.06	20.8	48.31	46.9	59.24	65.3	9.58	69.3	25.97	55.0
	.12	0.5	.14	0.0	.14	0.1	.20	0.4	0.58	0.9
May 10.2	34.94	21.3	48.17	46.9	59.10	65.4	9.38	68.9	25.39	54.1
	.10	0.5	.10	0.1	.10	0.0	.16	0.6	0.51	1.3
20.2	34.84	21.8	48.07	46.8	59.00	65.4	9.22	68.3	24.88	52.8
	.06	0.7	.07	0.2	.07	0.1	.11	0.9	0.40	1.8
30.1	34.78	22.5	48.00	46.6	58.93	65.3	9.11	67.4	24.48	51.0
	.03	0.7	.04	0.2	.04	0.2	.07	1.1	0.30	2.1
June 9.1	34.75	23.2	47.96	46.4	58.89	65.1	9.04	66.3	24.18	48.9
	.01	0.8	.01	0.4	.00	0.3	.01	1.4	0.17	2.4
19.1	34.76	24.0	47.97	46.0	58.89	64.8	9.03	64.9	24.01	46.5
	.04	0.8	.05	0.4	.04	0.4	.03	1.4	0.04	2.7
29.0	34.80	24.8	48.02	45.6	58.93	64.4	9.06	63.5	23.97	43.8
	.08	0.9	.09	0.4	.08	0.4	.09	1.6	0.09	2.7
July 9.0	34.88	25.7	48.11	45.2	59.01	64.0	9.15	61.9	24.06	41.1
	.11	0.8	.12	0.5	.11	0.4	.14	1.6	0.21	2.8
19.0	34.99	26.5	48.23	44.7	59.12	63.6	9.29	60.3	24.27	38.3
	.13	0.8	.16	0.6	.15	0.5	.18	1.7	0.34	2.9
29.0	35.12	27.3	48.39	44.1	59.27	63.1	9.47	58.6	24.61	35.4
	.17	0.7	.19	0.6	.18	0.6	.23	1.7	0.46	2.8
Aug. 8.0	35.29	28.0	48.58	43.5	59.45	62.5	9.70	56.9	25.07	32.6
	.19	0.6	.22	0.6	.21	0.6	.27	1.6	0.57	2.6
17.9	35.48	28.6	48.80	42.9	59.66	61.9	9.97	55.3	25.64	30.0
	.22	0.4	.25	0.7	.24	0.6	.30	1.6	0.66	2.6
27.9	35.70	29.0	49.05	42.2	59.90	61.3	10.27	53.7	26.30	27.4
	.24	0.2	.27	0.7	.27	0.8	.34	1.5	0.76	2.3
Sept. 6.9	35.94	29.2	49.32	41.5	60.17	60.5	10.61	52.2	27.06	25.1
	.26	0.0	.29	0.8	.28	0.8	.37	1.5	0.84	2.0
16.8	36.20	29.2	49.61	40.7	60.45	59.7	10.98	50.7	27.90	23.1
	.27	0.2	.31	0.8	.31	0.8	.40	1.3	0.90	1.7
26.8	36.47	29.0	49.92	39.9	60.76	58.9	11.38	49.4	28.80	21.4
	.29	0.5	.33	0.8	.32	0.9	.42	1.2	0.96	1.4
Oct. 6.8	36.76	28.5	50.25	39.1	61.08	58.0	11.80	48.2	29.76	20.0
	.30	0.7	.35	0.9	.34	0.9	.44	1.0	0.99	1.0
16.8	37.06	27.8	50.60	38.2	61.42	57.1	12.24	47.2	30.75	19.0
	.31	1.0	.35	0.8	.35	0.9	.45	0.8	1.02	0.5
26.7	37.37	26.8	50.95	37.4	61.77	56.2	12.69	46.4	31.77	18.5
	.32	1.2	.35	0.8	.35	0.9	.45	0.5	1.02	0.1
Nov. 5.7	37.69	25.6	51.30	36.6	62.12	55.3	13.14	45.9	32.79	18.4
	.31	1.3	.36	0.8	.36	0.9	.45	0.3	1.00	0.3
15.7	38.00	24.3	51.66	35.8	62.48	54.4	13.59	45.6	33.79	18.7
	.29	1.4	.34	0.6	.34	0.7	.44	0.0	0.96	0.8
25.7	38.29	22.9	52.00	35.2	62.82	53.7	14.03	45.6	34.75	19.5
	.28	1.5	.32	0.5	.33	0.6	.41	0.2	0.89	1.3
Dec. 5.6	38.57	21.4	52.32	34.7	63.15	53.1	14.44	45.8	35.64	20.8
	.25	1.5	.29	0.3	.30	0.5	.38	0.6	0.79	1.7
15.6	38.82	19.9	52.61	34.4	63.45	52.6	14.82	46.4	36.43	22.5
	.22	1.5	.26	0.1	.26	0.2	.33	0.9	0.68	2.1
25.6	39.04	18.4	52.87	34.3	63.71	52.4	15.15	47.3	37.11	24.6
	.18	1.3	.21	0.0	.22	0.1	.27	1.2	0.54	2.4
35.5	39.22	17.1	53.08	34.3	63.93	52.3	15.42	48.5	37.65	27.0

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\omega^1$ Cancri.		15 Argus ( $\rho$ ).		3 Ursæ Maj. (H.).		$\zeta^2$ Cancri.		$\beta$ Cancri.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 7 55	° ' " +25 38	h m 8 3	° ' " -24 2	h m 8 3	° ' " +68 44	h m 8 7	° ' " +17 55	h m 8 11	° ' " +9 27
Jan. 0.6	29.61	24.9	43.21	31.6	54.11	22.6	3.45	13.9	38.42	51.9
10.5	29.80	24.9	43.37	34.5	54.50	24.9	3.64	13.3	38.61	50.8
20.5	29.94	25.0	43.47	37.2	54.77	27.4	3.78	12.9	38.75	49.9
30.5	30.02	25.3	43.52	39.7	54.91	30.0	3.87	12.7	38.84	49.2
Feb. 9.5	30.05	25.8	43.51	42.1	54.93	32.7	3.91	12.7	38.87	48.7
19.4	30.02	26.4	43.46	44.1	54.82	35.3	3.89	12.8	38.86	48.3
Mar. 1.4	29.94	27.0	43.36	45.9	54.59	37.6	3.83	13.1	38.80	48.2
11.4	29.83	27.7	43.23	47.3	54.27	39.7	3.73	13.4	38.70	48.2
21.3	29.69	28.3	43.07	48.3	53.87	41.5	3.60	13.8	38.58	48.3
31.3	29.53	28.8	42.89	49.0	53.41	42.8	3.45	14.3	38.44	48.5
Apr. 10.3	29.35	29.3	42.70	49.3	52.93	43.6	3.29	14.7	38.28	48.7
20.3	29.18	29.7	42.51	49.2	52.44	43.9	3.14	15.1	38.13	49.1
30.2	29.03	30.0	42.33	48.8	51.96	43.8	2.99	15.5	37.99	49.5
May 10.2	28.89	30.2	42.17	48.1	51.53	43.1	2.86	15.8	37.86	50.0
20.2	28.78	30.2	42.03	47.0	51.15	42.1	2.75	16.1	37.75	50.5
30.2	28.71	30.2	41.92	45.6	50.84	40.6	2.67	16.3	37.67	51.0
June 9.1	28.67	30.1	41.84	44.0	50.62	38.7	2.62	16.5	37.62	51.5
19.1	28.66	29.9	41.79	42.1	50.48	36.6	2.61	16.7	37.61	52.1
29.1	28.70	29.6	41.77	40.1	50.44	34.2	2.63	16.8	37.62	52.6
July 9.0	28.77	29.2	41.79	37.9	50.49	31.7	2.69	16.9	37.67	53.2
19.0	28.87	28.8	41.85	35.7	50.64	29.0	2.78	17.0	37.74	53.7
29.0	29.01	28.4	41.94	33.5	50.88	26.3	2.90	16.9	37.85	54.1
Aug. 8.0	29.18	27.9	42.06	31.4	51.20	23.6	3.05	16.8	37.99	54.5
17.9	29.38	27.3	42.22	29.4	51.61	21.0	3.23	16.6	38.15	54.8
27.9	29.61	26.7	42.40	27.6	52.10	18.5	3.43	16.3	38.34	54.9
Sept. 6.9	29.87	26.0	42.62	26.2	52.65	16.2	3.66	15.9	38.56	54.8
16.9	30.14	25.2	42.86	25.1	53.27	14.1	3.92	15.3	38.80	54.6
26.8	30.44	24.3	43.12	24.5	53.94	12.2	4.19	14.6	39.06	54.1
Oct. 6.8	30.76	23.4	43.41	24.3	54.66	10.6	4.49	13.8	39.35	53.5
16.8	31.09	22.4	43.72	24.7	55.41	9.4	4.80	12.8	39.65	52.6
26.7	31.44	21.4	44.03	25.5	56.19	8.6	5.13	11.7	39.96	51.5
Nov. 5.7	31.79	20.4	44.36	26.8	56.97	8.1	5.46	10.5	40.28	50.3
15.7	32.14	19.5	44.68	28.5	57.75	8.1	5.80	9.3	40.61	48.9
25.7	32.48	18.6	44.99	30.7	58.51	8.6	6.13	8.1	40.93	47.5
Dec. 5.6	32.81	17.9	45.28	33.1	59.22	9.5	6.45	7.0	41.23	46.0
15.6	33.11	17.3	45.55	35.8	59.87	10.8	6.74	6.0	41.52	44.6
25.6	33.38	17.0	45.78	38.6	60.44	12.5	7.00	5.1	41.77	43.2
35.6	33.60	16.8	45.96	41.5	60.90	14.6	7.23	4.4	41.98	42.0

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	30 Monocerotis.		θ Chamæleontis.		η Cancrī.		σ Hydræ.		γ Cancrī.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 8 21	° ' " - 3 36	h m 8 23	° ' " - 77 11	h m 8 27	° ' " + 20 44	h m 8 34	° ' " + 3 39	h m 8 38	° ' " + 21 47
	s 10.18	" 38.8	s 26.75	" 25.4	s 30.68	" 52.4	s 3.53	" 33.0	s 5.09	" 35.1
Jan. 0.6	10.18	.18 38.8	26.75	.24 25.4	30.68	.21 52.4	3.53	.20 33.0	5.09	.22 35.1
10.6	10.36	.18 40.7	26.99	.24 29.1	30.89	.21 51.9	3.73	.20 31.5	5.31	.22 34.6
20.5	10.50	.14 42.4	27.05	.06 32.8	31.06	.17 51.6	3.88	.15 30.2	5.49	.18 34.4
30.5	10.58	.08 43.9	26.91	.14 36.6	31.17	.11 51.6	3.99	.11 29.0	5.61	.12 34.4
Feb. 9.5	10.62	.04 45.2	26.60	.31 40.2	31.23	.06 51.7	4.04	.05 28.1	5.68	.07 34.5
	10.62	.01 45.2	26.60	.49 40.2	31.23	.00 51.7	4.04	.00 28.1	5.68	.01 34.5
	10.61	.06 46.3	26.11	.63 43.7	31.23	.04 52.0	4.04	.04 27.4	5.69	.04 34.9
Mar. 1.4	10.55	.09 47.2	25.48	.76 46.8	31.19	.04 52.4	4.00	.04 26.9	5.66	.03 35.3
11.4	10.46	.09 47.8	24.72	.87 49.6	31.10	.09 52.9	3.92	.08 26.6	5.58	.08 35.9
21.4	10.34	.12 48.2	23.85	.95 52.0	30.98	.12 53.5	3.81	.11 26.4	5.47	.11 36.6
31.3	10.20	.14 48.4	22.90	1.01 53.9	30.84	.14 54.0	3.68	.13 26.5	5.34	.13 37.2
	10.20	.16 48.4	22.90	1.01 53.9	30.84	.15 54.0	3.68	.14 26.5	5.34	.15 37.2
Apr. 10.3	10.04	.15 48.4	21.89	1.03 55.4	30.69	.16 54.6	3.54	.15 26.7	5.19	.16 37.8
20.3	9.89	.15 48.2	20.86	1.04 56.3	30.53	.16 55.1	3.39	.15 27.0	5.03	.16 38.3
30.3	9.74	.13 47.8	19.82	1.02 56.7	30.38	.15 55.5	3.25	.14 27.4	4.88	.15 38.8
May 10.2	9.61	.11 47.2	18.80	0.98 56.6	30.24	.14 55.9	3.12	.13 27.9	4.74	.14 39.2
20.2	9.50	.09 46.5	17.82	0.91 55.9	30.13	.11 56.2	3.00	.12 28.5	4.62	.12 39.5
	9.50	.09 46.5	17.82	0.91 55.9	30.13	.09 56.2	3.00	.09 28.5	4.62	.10 39.5
	9.41	.07 45.7	16.91	0.82 54.7	30.04	.06 56.4	2.91	.06 29.1	4.52	.07 39.7
June 9.2	9.34	.03 44.7	16.09	0.71 53.1	29.98	.06 56.5	2.85	.06 29.8	4.45	.07 39.8
19.1	9.31	.03 43.6	15.38	0.59 51.0	29.95	.03 56.5	2.81	.04 30.6	4.42	.03 39.8
29.1	9.31	.00 42.5	14.79	0.46 48.5	29.95	.00 56.5	2.81	.00 31.4	4.41	.01 39.7
July 9.1	9.34	.06 41.3	14.33	0.30 45.7	29.99	.07 56.4	2.83	.02 32.2	4.44	.03 39.6
	9.34	.06 41.3	14.33	0.30 45.7	29.99	.07 56.4	2.83	.06 32.2	4.44	.06 39.6
	9.40	.09 40.1	14.03	0.14 42.7	30.06	.10 56.2	2.89	.08 32.9	4.50	.09 39.3
Aug. 8.0	9.49	.11 38.9	13.89	0.03 39.6	30.16	.10 55.9	2.97	.08 33.7	4.59	.09 39.0
18.0	9.60	.15 37.8	13.92	0.19 36.3	30.29	.13 55.6	3.08	.11 34.3	4.72	.13 38.5
27.9	9.75	.18 36.9	14.11	0.36 33.2	30.45	.16 55.2	3.22	.14 34.8	4.87	.15 38.0
	9.93	.20 36.1	14.47	0.52 30.2	30.64	.22 54.6	3.39	.19 35.2	5.05	.21 37.4
	9.93	.20 36.1	14.47	0.52 30.2	30.64	.22 54.6	3.39	.19 35.2	5.05	.21 37.4
Sept. 6.9	10.13	.22 35.6	14.99	0.66 27.5	30.86	.25 53.9	3.58	.22 35.3	5.26	.24 36.6
16.9	10.35	.25 35.3	15.65	0.78 25.2	31.11	.27 53.1	3.80	.22 35.3	5.50	.24 35.7
26.8	10.60	.27 35.3	16.43	0.89 23.3	31.38	.27 52.2	4.04	.24 35.0	5.76	.26 34.6
Oct. 6.8	10.87	.29 35.6	17.32	0.97 22.0	31.67	.29 51.2	4.31	.27 34.4	6.04	.28 33.5
16.8	11.16	.30 36.3	18.29	1.00 21.3	31.98	.32 50.0	4.60	.29 33.5	6.35	.31 32.3
	11.16	.30 36.3	18.29	1.00 21.3	31.98	.32 50.0	4.60	.30 33.5	6.35	.33 32.3
	11.46	.32 37.3	19.29	1.01 21.2	32.30	.34 48.8	4.90	.32 32.4	6.68	.34 31.0
Nov. 5.7	11.78	.31 38.6	20.30	0.98 21.8	32.64	.34 47.5	5.22	.32 31.1	7.02	.34 29.6
15.7	12.09	.32 40.1	21.28	0.92 23.1	32.99	.35 46.2	5.54	.32 29.6	7.37	.35 28.3
25.7	12.41	.30 41.9	22.20	0.81 24.9	33.33	.34 45.0	5.86	.32 27.9	7.72	.35 27.0
Dec. 5.7	12.71	.27 43.8	23.01	0.69 27.4	33.67	.31 43.9	6.17	.31 26.2	8.06	.32 25.8
	12.71	.27 43.8	23.01	0.69 27.4	33.67	.31 43.9	6.17	.30 26.2	8.06	.32 25.8
	12.98	.25 45.8	23.70	0.53 30.3	33.98	.28 42.8	6.47	.26 24.4	8.38	.29 24.7
25.6	13.23	.21 47.8	24.23	0.36 33.6	34.26	.24 42.0	6.73	.23 22.7	8.67	.29 23.8
35.6	13.44	.21 49.8	24.59	0.36 37.2	34.50	.24 41.3	6.96	.23 21.1	8.92	.29 23.2



# FIXED STARS, 1910.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Hydræ.		σ <sup>a</sup> Cancrī (mean).		ι Ursæ Majoris.		σ <sup>a</sup> Ursæ Majoris.		κ Cancrī.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m s	° ' "	h m s	° ' "	h m s	° ' "	h m s	° ' "	h m s	° ' "
	8 42	+ 6 44	8 48	+30 55	8 53	+48 23	9 2	+67 29	9 2	+11 1
Jan. 0.6	0.91	62.3	45.73	14.6	3.71	41.3	31.01	57.3	52.62	54.0
10.6	1.12	60.9	45.98	14.6	4.02	42.2	31.51	59.1	52.85	52.8
20.5	1.28	59.7	46.18	14.8	4.27	43.5	31.91	61.2	53.04	51.8
30.5	1.40	58.7	46.33	15.3	4.45	45.0	32.19	63.6	53.18	51.0
Feb. 9.5	1.46	58.0	46.41	16.0	4.56	46.7	32.35	66.2	53.26	50.5
19.5	1.47	57.4	46.44	16.9	4.59	48.5	32.39	68.9	53.30	50.1
Mar. 1.4	1.44	57.1	46.41	17.9	4.55	50.4	32.31	71.5	53.29	50.0
11.4	1.37	56.9	46.34	18.9	4.45	52.2	32.12	73.9	53.24	50.1
21.4	1.26	56.9	46.23	19.9	4.30	53.8	31.84	76.1	53.15	50.3
31.3	1.14	57.0	46.09	20.9	4.11	55.3	31.49	78.0	53.04	50.6
Apr. 10.3	1.00	57.3	45.93	21.8	3.89	56.5	31.09	79.5	52.90	51.0
20.3	0.85	57.7	45.76	22.5	3.65	57.4	30.65	80.6	52.76	51.4
30.3	0.71	58.1	45.59	23.0	3.42	57.9	30.21	81.2	52.62	51.9
May 10.2	0.58	58.6	45.44	23.4	3.20	58.1	29.77	81.2	52.49	52.4
20.2	0.46	59.1	45.30	23.5	3.01	58.0	29.37	80.8	52.37	52.9
30.2	0.37	59.7	45.19	23.5	2.84	57.5	29.01	79.9	52.27	53.4
June 9.2	0.30	60.3	45.11	23.3	2.71	56.7	28.70	78.6	52.20	53.8
19.1	0.26	60.9	45.06	23.0	2.62	55.6	28.46	76.9	52.15	54.3
29.1	0.25	61.5	45.04	22.5	2.57	54.3	28.30	74.8	52.13	54.7
July 9.1	0.27	62.1	45.06	21.8	2.57	52.8	28.21	72.5	52.13	55.1
19.0	0.32	62.7	45.11	21.0	2.61	51.1	28.21	69.9	52.16	55.4
29.0	0.40	63.2	45.20	20.1	2.70	49.2	28.29	67.1	52.22	55.6
Aug. 8.0	0.50	63.7	45.32	19.1	2.84	47.2	28.45	64.3	52.31	55.7
18.0	0.64	64.0	45.47	18.0	3.02	45.1	28.69	61.4	52.43	55.7
27.9	0.80	64.2	45.66	16.8	3.24	43.0	29.01	58.5	52.58	55.6
Sept. 6.9	0.99	64.2	45.87	15.5	3.50	40.9	29.41	55.6	52.75	55.3
16.9	1.20	64.0	46.12	14.2	3.80	38.8	29.88	52.9	52.95	54.8
26.9	1.44	63.5	46.39	12.8	4.14	36.8	30.41	50.3	53.18	54.1
Oct. 6.8	1.71	62.8	46.69	11.3	4.51	34.8	31.00	47.9	53.44	53.2
16.8	1.99	61.9	47.02	9.8	4.91	33.0	31.65	45.8	53.72	52.1
26.8	2.30	60.7	47.37	8.3	5.34	31.4	32.34	44.1	54.02	50.8
Nov. 5.7	2.62	59.3	47.73	6.9	5.79	30.0	33.07	42.7	54.34	49.3
15.7	2.94	57.8	48.11	5.6	6.26	28.9	33.81	41.8	54.67	47.8
25.7	3.26	56.2	48.48	4.5	6.72	28.1	34.56	41.3	55.00	46.1
Dec. 5.7	3.58	54.5	48.85	3.5	7.18	27.7	35.28	41.3	55.33	44.5
15.6	3.88	52.8	49.20	2.7	7.61	27.6	35.97	41.9	55.65	42.9
25.6	4.15	51.2	49.52	2.2	8.01	27.9	36.61	42.9	55.94	41.4
35.6	4.39	49.7	49.80	2.0	8.36	28.6	37.18	44.4	56.20	40.0

## FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\theta$ Hydræ.		$\beta$ Argûs.		$\iota$ Argûs.		$\alpha$ Lyncis.		$\alpha$ Hydræ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 9 9	° ' " + 24 1	h m 9 12	° ' " - 69 20	h m 9 14	° ' " - 58 53	h m 9 15	° ' " + 34 46	h m 9 23	° ' " - 8 15
	s	"	s	"	s	"	s	"	s	"
Jan. 0.6	41.13	44.8	15.32	28.9	42.03	33.1	34.84	23.3	10.03	57.6
10.6	41.36	43.1	15.66	32.5	42.31	36.7	35.13	23.3	10.26	59.8
20.6	41.55	41.6	15.88	36.3	42.50	40.4	35.36	23.6	10.45	61.9
30.5	41.69	40.3	15.98	40.2	42.62	44.2	35.54	24.3	10.60	63.9
Feb. 9.5	41.78	39.2	15.96	44.0	42.65	48.0	35.66	25.2	10.69	65.7
19.5	41.82	38.3	15.83	47.7	42.60	51.6	35.72	26.3	10.74	67.2
Mar. 1.5	41.81	37.7	15.60	51.2	42.47	54.9	35.72	27.5	10.74	68.5
11.4	41.76	37.3	15.27	54.5	42.27	58.0	35.67	28.8	10.69	69.5
21.4	41.68	37.1	14.86	57.3	42.02	60.7	35.58	30.0	10.61	70.3
31.4	41.57	37.0	14.38	59.8	41.72	63.0	35.45	31.2	10.51	70.8
Apr. 10.3	41.44	37.1	13.85	61.8	41.39	64.8	35.29	32.3	10.39	71.1
20.3	41.31	37.4	13.29	63.3	41.03	66.1	35.12	33.3	10.25	71.1
30.3	41.17	37.8	12.71	64.3	40.66	67.0	34.95	34.0	10.11	71.0
May 10.3	41.04	38.2	12.12	64.8	40.29	67.4	34.79	34.5	9.98	70.6
20.2	40.92	38.8	11.54	64.8	39.93	67.2	34.64	34.8	9.85	70.0
30.2	40.82	39.4	10.99	64.2	39.59	66.5	34.51	34.8	9.74	69.3
June 9.2	40.74	40.1	10.48	63.1	39.28	65.3	34.40	34.6	9.65	68.4
19.2	40.68	40.8	10.01	61.5	39.00	63.6	34.32	34.2	9.58	67.4
29.1	40.65	41.6	9.60	59.5	38.77	61.6	34.28	33.6	9.53	66.3
July 9.1	40.65	42.3	9.27	57.1	38.58	59.2	34.27	32.8	9.50	65.1
19.1	40.67	43.0	9.02	54.4	38.44	56.5	34.29	31.8	9.51	63.9
29.0	40.72	43.7	8.86	51.4	38.36	53.6	34.35	30.6	9.54	62.7
Aug. 8.0	40.80	44.3	8.79	48.3	38.35	50.6	34.44	29.4	9.59	61.5
18.0	40.90	44.8	8.82	45.1	38.40	47.6	34.57	28.0	9.68	60.4
28.0	41.04	45.1	8.96	42.0	38.52	44.6	34.73	26.4	9.79	59.5
Sept. 6.9	41.20	45.2	9.20	39.1	38.71	41.9	34.92	24.8	9.94	58.8
16.9	41.39	45.1	9.54	36.5	38.96	39.5	35.14	23.1	10.11	58.4
26.9	41.61	44.8	9.97	34.3	39.28	37.4	35.40	21.3	10.31	58.2
Oct. 6.9	41.85	44.1	10.49	32.6	39.65	35.9	35.69	19.5	10.55	58.4
16.8	42.12	43.2	11.08	31.4	40.08	34.9	36.02	17.7	10.81	58.9
26.8	42.42	42.1	11.72	30.9	40.54	34.6	36.37	16.0	11.10	59.8
Nov. 5.8	42.73	40.7	12.39	31.0	41.03	34.9	36.74	14.3	11.40	61.1
15.7	43.05	39.1	13.07	31.8	41.53	35.8	37.12	12.8	11.72	62.7
25.7	43.38	37.3	13.74	33.2	42.02	37.4	37.51	11.5	12.05	64.5
Dec. 5.7	43.70	35.4	14.37	35.3	42.50	39.6	37.90	10.4	12.37	66.6
15.7	44.01	33.5	14.95	37.9	42.94	42.3	38.28	9.5	12.69	68.8
25.6	44.30	31.6	15.45	41.0	43.32	45.4	38.63	9.0	12.98	71.0
35.6	44.56	29.8	15.85	44.4	43.65	48.8	38.95	8.8	13.24	73.3

# FIXED STARS, 1910.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	1 Draconis (H.).			2 Ursæ Majoris.			3 Ursæ Majoris.			10 Leonis Minoris.			11 Leonis.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.	
	h m s 9 24	° ' " -81 43		h m s 9 26	° ' " -70 13		h m s 9 26	° ' " +52 4		h m s 9 28	° ' " +36 47		h m s 9 36	° ' " +10 17	
Jan. 0.6	25.59	1.27	24.2	34.47	.60	29.1	51.31	.37	72.2	43.12	.31	49.0	20.98	.26	71.1
10.6	26.86	1.02	26.2	35.07	.50	30.7	51.68	.31	73.0	43.43	.25	49.0	21.24	.21	69.7
20.6	27.88	0.74	28.7	35.57	.37	32.8	51.99	.23	74.2	43.68	.20	49.4	21.45	.17	68.5
30.5	28.62	0.44	31.5	35.94	.24	35.1	52.22	.16	75.7	43.88	.14	50.1	21.62	.12	67.6
Feb. 9.5	29.06	0.13	34.5	36.18	.10	37.8	52.38	.08	77.5	44.02	.07	51.0	21.74	.07	66.9
19.5	29.19	0.18	37.6	36.28	.03	40.5	52.46	.01	79.5	44.09	.02	52.2	21.81	.02	66.4
Mar. 1.5	29.01	0.46	40.6	36.25	.16	43.3	52.47	.07	81.6	44.11	.04	53.6	21.83	.02	66.2
11.4	28.55	0.72	43.5	36.09	.27	45.9	52.40	.13	83.7	44.07	.08	55.0	21.81	.06	66.2
21.4	27.83	0.94	46.1	35.82	.36	48.4	52.27	.18	85.6	43.99	.12	56.4	21.75	.09	66.4
31.4	26.89	1.10	48.3	35.46	.44	50.5	52.09	.21	87.4	43.87	.15	57.7	21.66	.11	66.7
Apr. 10.4	25.79	1.22	50.0	35.02	.48	52.3	51.88	.24	89.0	43.72	.17	58.9	21.55	.12	67.1
20.3	24.57	1.29	51.3	34.54	.50	53.6	51.64	.25	90.2	43.55	.17	60.0	21.43	.13	67.5
30.3	23.28	1.30	52.0	34.04	.50	54.5	51.39	.24	91.0	43.38	.17	60.8	21.30	.13	68.1
May 10.3	21.98	1.26	52.1	33.54	.49	54.8	51.15	.23	91.5	43.21	.16	61.4	21.17	.12	68.6
20.2	20.72	1.18	51.7	33.05	.45	54.6	50.92	.21	91.6	43.05	.14	61.8	21.05	.11	69.2
30.2	19.54	1.06	50.7	32.60	.39	53.9	50.71	.18	91.4	42.91	.12	61.9	20.94	.09	69.7
June 9.2	18.48	0.91	49.2	32.21	.33	52.7	50.53	.14	90.7	42.79	.09	61.7	20.85	.07	70.2
19.2	17.57	0.72	47.2	31.88	.25	51.1	50.39	.10	89.7	42.70	.06	61.2	20.78	.05	70.7
29.1	16.85	0.52	44.9	31.63	.17	49.1	50.29	.06	88.4	42.64	.02	60.6	20.73	.02	71.1
July 9.1	16.33	0.31	42.2	31.46	.08	46.8	50.23	.01	86.8	42.62	.01	59.7	20.71	.01	71.4
19.1	16.02	0.08	39.2	31.38	.01	44.2	50.22	.04	84.9	42.63	.04	58.6	20.72	.03	71.7
29.1	15.94	0.14	36.0	31.39	.10	41.4	50.26	.09	82.8	42.67	.08	57.3	20.75	.05	72.0
Aug. 8.0	16.08	0.37	32.6	31.49	.19	38.4	50.35	.13	80.6	42.75	.11	55.9	20.80	.09	72.1
18.0	16.45	0.59	29.2	31.68	.28	35.3	50.48	.18	78.2	42.86	.15	54.4	20.89	.11	72.0
28.0	17.04	0.80	25.8	31.96	.37	32.2	50.66	.22	75.8	43.01	.18	52.7	21.00	.14	71.8
Sept. 6.9	17.84	1.00	22.5	32.33	.46	29.1	50.88	.27	73.3	43.19	.22	50.9	21.14	.17	71.5
16.9	18.84	1.19	19.3	32.79	.53	26.1	51.15	.32	70.8	43.41	.25	49.0	21.31	.20	70.9
26.9	20.03	1.37	16.3	33.32	.61	23.2	51.47	.36	68.3	43.66	.28	47.1	21.51	.23	70.1
Oct. 6.9	21.40	1.52	13.6	33.93	.68	20.5	51.83	.39	65.9	43.94	.32	45.1	21.74	.26	69.1
16.8	22.92	1.64	11.2	34.61	.74	18.1	52.22	.44	63.7	44.26	.35	43.2	22.00	.29	67.9
26.8	24.56	1.74	9.2	35.35	.78	16.0	52.66	.46	61.6	44.61	.37	41.3	22.29	.31	66.5
Nov. 5.8	26.30	1.80	7.6	36.13	.82	14.3	53.12	.48	59.8	44.98	.39	39.5	22.60	.32	64.9
15.8	28.10	1.82	6.6	36.95	.83	13.1	53.60	.50	58.3	45.37	.40	37.9	22.92	.34	63.2
25.7	29.92	1.79	6.1	37.78	.82	12.3	54.10	.49	57.2	45.77	.39	36.4	23.26	.33	61.4
Dec. 5.7	31.71	1.71	6.2	38.60	.79	12.1	54.59	.48	56.4	46.17	.39	35.2	23.60	.34	59.6
15.7	33.42	1.58	6.9	39.39	.74	12.4	55.07	.45	56.1	46.56	.37	34.3	23.93	.31	57.9
25.6	35.00	1.40	8.1	40.13	.66	13.2	55.52	.41	56.2	46.93	.34	33.8	24.24	.28	56.2
35.6	36.40	9.8	9.8	40.79		14.5	55.93		56.7	47.27		33.6	24.52		54.7

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Chamæleonis.			ε Leonis.			μ Leonis.			19 Leonis Minoris.			π Leonis.		
	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	9 36		80 31	9 40		24 11	9 47		26 25	9 52		41 28	9 55		8 28
Jan. 0.6	39.15	0.71	52.5	44.81	0.28	20.0	38.92	0.29	51.4	10.85	0.34	60.6	27.48	0.27	38.2
10.6	39.86	0.49	55.8	45.09	0.24	19.3	39.21	0.25	50.8	11.19	0.29	60.6	27.75	0.23	36.7
20.6	40.35	0.25	59.4	45.33	0.19	18.9	39.46	0.20	50.4	11.48	0.24	61.1	27.98	0.19	35.3
30.6	40.60	0.02	63.2	45.52	0.14	18.8	39.66	0.14	50.4	11.72	0.17	62.0	28.17	0.13	34.2
Feb. 9.5	40.62	0.22	67.1	45.66	0.08	18.9	39.80	0.09	50.7	11.89	0.11	63.1	28.30	0.09	33.4
19.5	40.40	0.44	70.9	45.74	0.03	19.3	39.89	0.04	51.3	12.05	0.05	64.5	28.39	0.04	32.8
Mar 1.5	39.96	0.64	74.7	45.77	0.02	20.0	39.93	0.01	52.0	12.05	0.02	66.1	28.43	0.00	32.4
11.4	39.32	0.82	78.2	45.75	0.06	20.7	39.92	0.06	52.9	12.03	0.06	67.8	28.43	0.05	32.3
21.4	38.50	0.99	81.4	45.69	0.09	21.6	39.86	0.09	53.9	11.97	0.11	69.5	28.38	0.07	32.4
31.4	37.51	1.11	84.3	45.60	0.12	22.5	39.77	0.11	54.9	11.86	0.15	71.1	28.31	0.10	32.6
Apr. 10.4	36.40	1.21	86.8	45.48	0.14	23.4	39.66	0.14	55.9	11.71	0.17	72.6	28.21	0.11	32.9
20.3	35.19	1.28	88.9	45.34	0.14	24.3	39.52	0.14	56.9	11.54	0.18	73.9	28.10	0.13	33.4
30.3	33.91	1.32	90.5	45.20	0.14	25.0	39.38	0.15	57.7	11.36	0.18	74.9	27.97	0.12	33.9
May 10.3	32.59	1.34	91.5	45.06	0.13	25.7	39.23	0.13	58.4	11.18	0.18	75.7	27.85	0.12	34.4
20.3	31.25	1.31	92.0	44.93	0.12	26.2	39.10	0.12	58.9	11.00	0.16	76.2	27.73	0.11	35.0
30.2	29.94	1.27	92.0	44.81	0.10	26.6	38.98	0.11	59.3	10.84	0.14	76.4	27.62	0.09	35.6
June 9.2	28.67	1.18	91.4	44.71	0.08	26.8	38.87	0.08	59.5	10.70	0.12	76.2	27.53	0.08	36.1
19.2	27.49	1.08	90.3	44.63	0.05	26.8	38.79	0.06	59.5	10.58	0.08	75.7	27.45	0.05	36.6
29.1	26.41	0.94	88.7	44.58	0.03	26.7	38.73	0.03	59.3	10.50	0.06	75.0	27.40	0.04	37.1
July 9.1	25.47	0.78	86.7	44.55	0.00	26.5	38.70	0.01	59.0	10.44	0.02	74.0	27.36	0.01	37.5
19.1	24.69	0.59	84.3	44.55	0.03	26.1	38.69	0.02	58.4	10.42	0.01	72.8	27.35	0.01	37.9
29.1	24.10	0.38	81.6	44.58	0.06	25.5	38.71	0.05	57.7	10.43	0.05	71.3	27.36	0.04	38.2
Aug. 8.0	23.72	0.16	78.6	44.64	0.09	24.8	38.76	0.08	56.9	10.48	0.08	69.6	27.40	0.06	38.4
18.0	23.56	0.07	75.5	44.73	0.12	23.9	38.84	0.11	55.9	10.56	0.12	67.7	27.46	0.10	38.4
28.0	23.63	0.30	72.4	44.85	0.15	22.9	38.95	0.15	54.7	10.68	0.16	65.7	27.56	0.12	38.3
Sept. 7.0	23.93	0.53	69.4	45.00	0.18	21.7	39.10	0.17	53.4	10.84	0.20	63.6	27.68	0.15	38.0
16.9	24.46	0.75	66.5	45.18	0.21	20.4	39.27	0.21	51.9	11.04	0.24	61.4	27.83	0.18	37.5
26.9	25.21	0.94	64.0	45.39	0.25	18.9	39.48	0.25	50.3	11.28	0.28	59.1	28.01	0.22	36.7
Oct. 6.9	26.15	1.11	61.9	45.64	0.27	17.3	39.73	0.27	48.6	11.56	0.31	56.8	28.23	0.24	35.8
16.8	27.26	1.24	60.3	45.91	0.31	15.7	40.00	0.31	46.8	11.87	0.35	54.6	28.47	0.28	34.6
26.8	28.50	1.32	59.2	46.22	0.32	13.9	40.31	0.33	45.0	12.22	0.38	52.4	28.75	0.30	33.2
Nov. 5.8	29.82	1.36	58.8	46.54	0.35	12.1	40.64	0.35	43.1	12.60	0.40	50.3	29.05	0.32	31.6
15.8	31.18	1.35	57.1	46.89	0.36	10.3	40.99	0.36	41.3	13.00	0.42	48.4	29.37	0.33	29.8
25.7	32.53	1.29	60.0	47.25	0.37	8.6	41.35	0.37	39.5	13.42	0.43	46.8	29.70	0.34	27.9
Dec. 5.7	33.82	1.19	61.5	47.62	0.35	7.1	41.72	0.36	37.9	13.85	0.42	45.5	30.04	0.33	26.0
15.7	35.01	1.03	63.7	47.97	0.34	5.7	42.08	0.35	36.5	14.27	0.40	44.5	30.37	0.32	24.1
25.7	36.04	0.85	66.4	48.31	0.30	4.5	42.43	0.31	35.4	14.67	0.37	43.9	30.69	0.29	22.3
35.6	36.89		69.5	48.61		3.6	42.74		34.5	15.04		43.7	30.98		20.6

# FIXED STARS, 1910.

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(CONSTANTS OF STRÜVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Leonis. (Regulus.)			$\beta$ Ursæ Majoris.			$\lambda$ Ursæ Majoris.			$\gamma^1$ Leonis.			$\mu$ Hydræ.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.
	h m 10 3	° ' " +12 24	° ' " 10 11	h m 10 11	° ' " +65 33	° ' " 10 11	h m 10 11	° ' " +43 21	° ' " 10 15	h m 10 15	° ' " +20 17	° ' " 10 21	h m 10 21	° ' " -16 22	° ' "
Jan. 0.7	34.77	.28	28.7	31.73	19.2	1.0	40.67	45.8	0.68	49.4	1.1	44.09	.28	25.2	2.6
10.6	35.05	.24	27.3	32.30	20.2	1.4	41.04	45.8	0.98	48.3	0.8	44.37	.24	27.8	2.5
20.6	35.29	.20	26.1	32.80	21.6	1.9	41.36	46.2	1.24	47.5	0.5	44.61	.20	30.3	2.4
30.6	35.49	.15	25.2	33.21	23.5	2.2	41.62	47.0	1.46	47.0	0.2	44.81	.15	32.7	2.3
Feb. 9.5	35.64	.10	24.6	33.52	25.7	2.5	41.82	48.2	1.63	46.8	0.1	44.96	.10	35.0	2.2
19.5	35.74	.05	24.2	33.72	28.2	2.7	41.96	49.6	1.75	46.9	0.4	45.06	.05	37.2	1.9
Mar. 1.5	35.79	.00	24.1	33.80	30.9	2.7	42.03	51.3	1.81	47.3	0.5	45.11	.01	39.1	1.6
11.5	35.79	.03	24.2	33.78	33.6	2.5	42.04	53.1	1.83	47.8	0.7	45.12	.02	40.7	1.3
21.4	35.76	.07	24.5	33.66	36.1	2.5	41.99	55.0	1.81	48.5	0.8	45.10	.07	42.0	1.1
31.4	35.69	.10	24.9	33.45	38.6	2.1	41.90	56.7	1.74	49.3	0.9	45.03	.09	43.1	0.9
Apr. 10.4	35.59	.11	25.4	33.17	40.7	1.8	41.76	58.4	1.65	50.2	0.9	44.94	.10	44.0	0.5
20.4	35.48	.12	26.0	32.84	42.5	1.3	41.60	59.9	1.54	51.1	0.8	44.84	.12	44.5	0.3
30.3	35.36	.13	26.6	32.47	43.8	0.9	41.43	61.1	1.42	51.9	0.8	44.72	.13	44.8	0.0
May 10.3	35.23	.12	27.2	32.08	44.7	0.4	41.24	62.1	1.30	52.7	0.6	44.59	.13	44.8	0.2
20.3	35.11	.11	27.8	31.69	45.1	0.0	41.06	62.7	1.17	53.3	0.6	44.46	.12	44.6	0.5
30.2	35.00	.09	28.4	31.32	45.1	0.6	40.88	63.0	1.06	53.9	0.4	44.34	.11	44.1	0.7
June 9.2	34.91	.08	28.9	30.97	44.5	1.0	40.72	62.9	0.95	54.3	0.2	44.23	.10	43.4	0.9
19.2	34.83	.06	29.3	30.66	43.5	1.5	40.59	62.6	0.86	54.5	0.1	44.13	.09	42.5	1.0
29.2	34.77	.04	29.7	30.40	42.0	1.9	40.48	61.9	0.79	54.6	0.0	44.04	.07	41.5	1.2
July 9.1	34.73	.02	29.9	30.19	40.1	2.2	40.40	60.9	0.74	54.6	0.2	43.97	.05	40.3	1.3
19.1	34.71	.01	30.1	30.05	37.9	2.5	40.35	59.6	0.72	54.4	0.4	43.92	.03	39.0	1.4
29.1	34.72	.03	30.2	29.97	35.4	2.8	40.34	58.0	0.72	54.0	0.5	43.89	.00	37.6	1.4
Aug. 8.1	34.75	.05	30.1	29.95	32.6	3.0	40.36	56.3	0.74	53.5	0.7	43.89	.02	36.2	1.3
18.0	34.80	.09	29.9	30.01	29.6	3.1	40.42	54.3	0.79	52.8	0.9	43.91	.06	34.9	1.3
28.0	34.89	.11	29.5	30.14	26.5	3.2	40.52	52.1	0.87	51.9	1.0	43.97	.08	33.6	1.1
Sept. 7.0	35.00	.15	29.0	30.34	23.3	3.2	40.65	49.8	0.98	50.9	1.2	44.05	.12	32.5	0.8
16.9	35.15	.18	28.2	30.61	20.1	3.1	40.83	47.4	1.12	49.7	1.4	44.17	.16	31.7	0.6
26.9	35.33	.21	27.3	30.96	17.0	3.1	41.05	45.0	1.30	48.3	1.6	44.33	.19	31.1	0.2
Oct. 6.9	35.54	.24	26.1	31.37	13.9	2.9	41.31	42.5	1.50	46.7	1.7	44.52	.22	30.9	0.1
16.9	35.78	.27	24.7	31.86	11.0	2.6	41.61	40.0	1.75	45.0	1.9	44.74	.27	31.0	0.5
26.8	36.05	.30	23.2	32.40	8.4	2.3	41.95	37.6	2.03	43.1	1.9	45.01	.29	31.5	0.9
Nov. 5.8	36.35	.32	21.5	33.00	6.1	2.0	42.32	35.4	2.33	41.2	2.0	45.30	.31	32.4	1.3
15.8	36.67	.34	19.6	33.65	4.1	1.5	42.73	33.3	2.66	39.2	2.0	45.61	.33	33.7	1.7
25.8	37.01	.34	17.7	34.32	2.6	1.1	43.15	31.5	3.00	37.2	1.9	45.94	.34	35.4	2.0
Dec. 5.7	37.35	.34	15.8	35.01	1.5	0.5	43.59	30.0	3.36	35.3	1.7	46.28	.34	37.4	2.2
15.7	37.69	.33	14.0	35.69	1.0	0.1	44.02	28.8	3.72	33.6	1.5	46.62	.32	39.6	2.5
25.7	38.02	.30	12.3	36.35	1.1	0.6	44.44	28.1	4.06	32.1	1.3	46.94	.30	42.1	2.5
35.6	38.32		10.7	36.97	1.7		44.83	27.8	4.38	30.8		47.24		44.6	

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Leonis Minoris.			$\alpha$ Antliae.			$\gamma$ Draconis (H.).			$\rho$ Leonis.			$\delta$ Leonis Minoris.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m	s	°	h m	s	°	h m	s	°	h m	s	°	h m	s	°
	10 22		+37 9	10 23		-30 36	10 27		+76 10	10 28		+ 9 45	10 38		+23 39
Jan. 0.7	41.07		62.6	1.85		20.1	30.74		27.0	4.25		74.7	31.34		33.8
10.6	41.42	.35	62.2	2.14	.29	23.0	31.70	.96	28.1	4.54	.29	73.1	31.66	.32	32.7
20.6	41.72	.30	62.2	2.39	.25	26.0	32.54	.84	29.8	4.80	.26	71.7	31.95	.29	32.0
30.6	41.98	.26	62.6	2.59	.20	29.0	33.23	.69	31.9	5.01	.21	70.5	32.19	.24	31.6
Feb. 9.6	42.18	.20	63.4	2.74	.15	32.0	33.76	.53	34.4	5.18	.17	69.7	32.39	.20	31.5
		.14			.10			.35			.13			.14	
19.5	42.32		64.5	2.84		34.9	34.11		37.2	5.31		69.1	32.53		31.7
Mar. 1.5	42.40	.08	65.8	2.88	.04	37.5	34.27	.16	40.2	5.38	.07	68.8	32.62	.09	32.2
11.5	42.43	.03	67.3	2.88	.00	39.9	34.25	.02	43.1	5.41	.03	68.7	32.66	.04	33.0
21.4	42.40	.03	68.9	2.84	.04	42.0	34.06	.19	46.0	5.40	.01	68.8	32.66	.00	33.9
31.4	42.33	.07	70.5	2.76	.08	43.8	33.71	.35	48.7	5.35	.05	69.1	32.62	.04	34.9
		.11			.10			.48			.07			.07	
Apr. 10.4	42.22		72.0	2.66		45.3	33.23		51.1	5.28		69.5	32.55		36.0
20.4	42.09	.13	73.4	2.53	.13	46.4	32.64	.59	53.0	5.18	.10	70.1	32.45	.10	37.1
30.3	41.94	.15	74.6	2.38	.15	47.2	31.97	.67	54.5	5.07	.11	70.7	32.33	.12	38.1
May 10.3	41.78	.16	75.6	2.23	.15	47.6	31.25	.72	55.5	4.96	.11	71.3	32.21	.12	39.0
20.3	41.62	.16	76.3	2.08	.15	47.6	30.52	.73	56.0	4.85	.11	71.9	32.08	.13	39.8
		.15			.15			.73			.11			.12	
30.3	41.47		76.8	1.93		47.3	29.79		55.9	4.74		72.5	31.96		40.4
June 9.2	41.33	.14	76.9	1.78	.15	46.7	29.09	.70	55.3	4.64	.10	73.0	31.85	.11	40.9
19.2	41.21	.12	76.8	1.65	.13	45.8	28.45	.64	54.1	4.55	.09	73.5	31.75	.10	41.1
29.2	41.11	.10	76.4	1.53	.12	44.5	27.88	.57	52.5	4.48	.07	74.0	31.66	.09	41.2
July 9.1	41.03	.08	75.7	1.43	.10	43.0	27.40	.48	50.4	4.42	.06	74.4	31.60	.06	41.1
		.05			.07			.38			.03			.05	
19.1	40.98		74.7	1.36		41.3	27.02		47.9	4.39		74.7	31.55		40.8
29.1	40.96	.02	73.5	1.31	.05	39.5	26.76	.26	45.1	4.37	.02	74.9	31.52	.03	40.3
Aug. 8.1	40.98	.02	72.1	1.28	.03	37.5	26.61	.15	42.0	4.38	.01	74.9	31.52	.00	40.7
18.0	41.02	.04	70.4	1.29	.01	35.5	26.58	.03	38.7	4.38	.03	74.8	31.55	.03	39.6
28.0	41.10	.08	68.6	1.33	.04	33.6	26.68	.10	35.3	4.41	.06	74.5	31.60	.05	38.7
		.11			.08			.23			.09			.08	
Sept. 7.0	41.21		66.6	1.41		31.8	26.91		31.7	4.56		74.1	31.68		36.3
17.0	41.36	.15	64.4	1.53	.12	30.2	27.27	.36	28.2	4.68	.12	73.4	31.80	.12	34.9
26.9	41.55	.19	62.2	1.69	.16	28.9	27.76	.49	24.7	4.84	.16	72.6	31.96	.16	33.2
Oct. 6.9	41.78	.23	59.9	1.89	.20	27.9	28.38	.62	21.4	5.03	.19	71.5	32.15	.19	31.4
16.9	42.05	.27	57.5	2.13	.24	27.4	29.11	.73	18.2	5.25	.22	70.1	32.37	.22	29.4
		.31			.28			.84			.25			.26	
26.8	42.36		55.1	2.41		27.4	29.95		15.4	5.50		68.6	32.63		27.3
Nov. 5.8	42.70	.34	52.8	2.72	.31	27.8	30.89	.94	12.9	5.79	.29	66.9	32.93	.30	25.2
15.8	43.07	.37	50.7	3.06	.34	28.7	31.90	.101	10.8	6.10	.31	65.0	33.25	.32	23.1
25.8	43.46	.39	48.7	3.41	.35	30.1	32.98	.108	9.2	6.43	.33	63.0	33.60	.35	21.0
Dec. 5.7	43.86	.40	47.0	3.77	.36	32.0	34.08	.110	8.2	6.77	.34	61.0	33.96	.36	19.0
		.41			.36			.111			.34			.36	
15.7	44.27		45.6	4.13		34.2	35.19		7.8	7.11		59.0	34.32		17.1
25.7	44.66	.39	44.5	4.47	.34	36.8	36.26	.107	7.9	7.44	.33	57.1	34.68	.36	15.5
35.7	45.03	.37	43.8	4.79	.32	39.7	37.27	.101	8.7	7.76	.32	55.4	35.02	.34	14.2

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♋ Argūs.		♌ Leonis.		♍ Chamæleontis.		46 Leonis Minoris.		Groombridge 1706.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 10 41	° ' " -59 12	h m 10 44	° ' " +11 0	h m 10 44	° ' " -80 3	h m 10 48	° ' " +34 41	h m 10 52	° ' " +78 14
Jan. 0.7	34.23	18.9	31.43	79.6	59.17	31.5	16.82	56.5	49.47	57.7
10.6	34.64	21.9	31.74	78.0	60.18	34.3	17.17	55.8	50.62	58.5
20.6	35.00	25.3	32.01	76.6	61.03	37.5	17.49	55.4	51.66	59.9
30.6	35.29	28.9	32.24	75.5	61.68	41.0	17.77	55.5	52.54	61.9
Feb. 9.6	35.50	32.6	32.43	74.7	62.13	44.8	17.99	56.0	53.25	64.3
19.5	35.63	36.4	32.57	74.1	62.36	48.7	18.16	56.9	53.76	67.0
Mar. 1.5	35.68	40.1	32.66	73.8	62.38	52.6	18.27	58.0	54.05	69.9
11.5	35.66	43.6	32.70	73.8	62.20	56.5	18.33	59.4	54.13	73.0
21.5	35.57	46.9	32.70	74.0	61.83	60.2	18.33	60.9	54.00	76.0
31.4	35.43	50.0	32.67	74.4	61.28	63.8	18.29	62.5	53.68	78.8
Apr. 10.4	35.23	52.7	32.61	74.9	60.57	67.0	18.21	64.0	53.19	81.4
20.4	34.98	55.0	32.53	75.5	59.72	69.9	18.10	65.5	52.56	83.6
30.3	34.71	56.9	32.43	76.1	58.75	72.3	17.97	66.8	51.82	85.4
May 10.3	34.41	58.3	32.32	76.8	57.69	74.3	17.83	68.0	51.00	86.7
20.3	34.09	59.3	32.21	77.5	56.57	75.8	17.69	68.9	50.13	87.4
30.3	33.76	59.7	32.10	78.1	55.40	76.8	17.54	69.5	49.25	87.6
June 9.2	33.44	59.7	32.00	78.7	54.21	77.2	17.40	69.9	48.39	87.2
19.2	33.13	59.1	31.91	79.2	53.04	77.1	17.28	70.0	47.57	86.3
29.2	32.83	58.1	31.83	79.6	51.91	76.4	17.17	69.8	46.81	84.9
July 9.2	32.56	56.6	31.77	79.9	50.86	75.2	17.08	69.3	46.15	83.0
19.1	32.31	54.7	31.72	80.2	49.90	73.5	17.01	68.5	45.59	80.6
29.1	32.11	52.5	31.69	80.3	49.08	71.3	16.97	67.5	45.15	77.9
Aug. 8.1	31.96	49.9	31.69	80.3	48.42	68.8	16.96	66.2	44.84	74.9
18.0	31.87	47.2	31.71	80.1	47.94	66.0	16.97	64.7	44.67	71.6
28.0	31.84	44.4	31.75	79.8	47.66	63.0	17.02	63.0	44.64	68.1
Sept 7.0	31.88	41.6	31.82	79.2	47.60	60.0	17.10	61.1	44.76	64.5
17.0	31.99	38.9	31.93	78.4	47.76	56.9	17.21	59.0	45.04	60.8
26.9	32.17	36.4	32.07	77.4	48.16	54.0	17.36	56.8	45.47	57.1
Oct. 6.9	32.43	34.2	32.24	76.2	48.77	51.4	17.56	54.4	46.05	53.6
16.9	32.76	32.5	32.45	74.8	49.59	49.1	17.80	51.9	46.78	50.2
26.9	33.15	31.3	32.69	73.2	50.59	47.3	18.07	49.4	47.65	47.1
Nov. 5.8	33.59	30.6	32.97	71.4	51.74	46.1	18.38	47.0	48.65	44.3
15.8	34.08	30.6	33.27	69.4	53.00	45.4	18.73	44.6	49.75	41.9
25.8	34.60	31.2	33.60	67.4	54.32	45.4	19.10	42.4	50.94	40.0
Dec. 5.7	35.13	32.4	33.94	65.3	55.66	46.1	19.49	40.4	52.18	38.7
15.7	35.65	34.2	34.29	63.3	56.96	47.5	19.89	38.7	53.45	37.9
25.7	36.14	36.5	34.63	61.4	58.19	49.4	20.28	37.3	54.71	37.7
35.7	36.60	39.3	34.95	59.6	59.30	51.9	20.65	36.3	55.91	38.2

## FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Majoris.		$\gamma$ Octantis.		$\rho^3$ Leonis.		$\psi$ Ursæ Majoris.		$\delta$ Leonis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 10 58	° ' " +62 13	h m 10 59	° ' " -84 6	h m 11 2	° ' " +2 26	h m 11 4	° ' " +44 58	h m 11 9	° ' " +21 0
	s	"	s	"	s	"	s	"	s	"
Jan. 0.7	11.52	63.1	61.20	10.0	18.45	44.2	36.49	65.7	19.13	59.4
	.57	0.3	1.73	2.6	.30	2.0	.41	0.5	.33	1.4
10.7	12.09	63.4	62.93	12.6	18.75	42.2	36.90	65.2	19.46	58.0
	.51	0.8	1.47	3.0	.27	1.8	.37	0.0	.30	1.1
20.6	12.60	64.2	64.40	15.6	19.02	40.4	37.27	65.2	19.76	56.9
	.45	1.3	1.16	3.4	.24	1.6	.32	0.5	.26	0.7
30.6	13.05	65.5	65.56	19.0	19.26	38.8	37.59	65.7	20.02	56.2
	.36	1.8	0.84	3.6	.20	1.4	.27	1.0	.22	0.4
Feb. 9.6	13.41	67.3	66.40	22.6	19.46	37.4	37.86	66.7	20.24	55.8
	.27	2.1	0.50	3.9	.15	1.1	.21	1.3	.17	0.0
19.5	13.68	69.4	66.90	26.5	19.61	36.3	38.07	68.0	20.41	55.8
	.17	2.5	0.16	3.9	.11	0.8	.14	1.7	.12	0.3
Mar. 1.5	13.85	71.9	67.06	30.4	19.72	35.5	38.21	69.7	20.53	56.1
	.08	2.6	0.19	3.9	.06	0.6	.08	1.9	.08	0.6
11.5	13.93	74.5	66.87	34.3	19.78	34.9	38.29	71.6	20.61	56.7
	.01	2.6	0.51	3.8	.02	0.4	.02	2.0	.03	0.8
21.5	13.92	77.1	66.36	38.1	19.80	34.5	38.31	73.6	20.64	57.5
	.10	2.6	0.81	3.7	.02	0.1	.04	2.0	.01	0.9
31.4	13.82	79.7	65.55	41.8	19.78	34.4	38.27	75.6	20.63	58.4
	.17	2.4	1.10	3.4	.05	0.1	.08	2.0	.05	1.0
Apr. 10.4	13.65	82.1	64.45	45.2	19.73	34.5	38.19	77.6	20.58	59.4
	.23	2.2	1.35	3.1	.07	0.2	.12	1.9	.07	1.1
20.4	13.42	84.3	63.10	48.3	19.66	34.7	38.07	79.5	20.51	60.5
	.27	1.8	1.56	2.7	.08	0.4	.15	1.7	.09	1.0
30.4	13.15	86.1	61.54	51.0	19.58	35.1	37.92	81.2	20.42	61.5
	.31	1.5	1.75	2.2	.10	0.5	.17	1.4	.10	1.0
May 10.3	12.84	87.6	59.79	53.2	19.48	35.6	37.75	82.6	20.32	62.5
	.32	1.0	1.88	1.8	.10	0.5	.18	1.1	.11	0.9
20.3	12.52	88.6	57.91	55.0	19.38	36.1	37.57	83.7	20.21	63.4
	.33	0.5	1.99	1.3	.11	0.6	.18	0.7	.12	0.8
30.3	12.19	89.1	55.92	56.3	19.27	36.7	37.39	84.4	20.09	64.2
	.32	0.0	2.03	0.7	.10	0.6	.18	0.4	.11	0.6
June 9.2	11.87	89.1	53.89	57.0	19.17	37.3	37.21	84.8	19.98	64.8
	.30	0.5	2.04	0.2	.09	0.6	.16	0.0	.10	0.4
19.2	11.57	88.6	51.85	57.2	19.08	37.9	37.05	84.8	19.88	65.2
	.27	0.9	2.00	0.4	.08	0.6	.15	0.4	.10	0.3
29.2	11.30	87.7	49.85	56.8	19.00	38.5	36.90	84.4	19.78	65.5
	.24	1.3	1.89	0.9	.08	0.6	.13	0.7	.08	0.0
July 9.2	11.06	86.4	47.96	55.9	18.92	39.1	36.77	83.7	19.70	65.5
	.20	1.8	1.74	1.5	.06	0.5	.11	1.1	.06	0.1
19.1	10.86	84.6	46.22	54.4	18.86	39.6	36.66	82.6	19.64	65.4
	.16	2.2	1.53	1.9	.04	0.5	.08	1.4	.05	0.3
29.1	10.70	82.4	44.69	52.5	18.82	40.1	36.58	81.2	19.59	65.1
	.10	2.5	1.28	2.3	.02	0.4	.05	1.7	.03	0.5
Aug. 8.1	10.60	79.9	43.41	50.2	18.80	40.5	36.53	79.5	19.56	64.6
	.04	2.7	0.98	2.6	.00	0.3	.02	2.0	.01	0.8
18.1	10.56	77.2	42.43	47.6	18.80	40.8	36.51	77.5	19.55	63.8
	.01	3.0	0.65	2.9	.02	0.1	.02	2.3	.02	1.0
28.0	10.57	74.2	41.78	44.7	18.82	40.9	36.53	75.2	19.57	62.8
	.08	3.2	0.28	3.1	.05	0.1	.06	2.4	.05	1.1
Sept. 7.0	10.65	71.0	41.50	41.6	18.87	40.8	36.59	72.8	19.62	61.7
	.14	3.3	0.10	3.1	.08	0.3	.10	2.6	.08	1.4
17.0	10.79	67.7	41.60	38.5	18.95	40.5	36.69	70.2	19.70	60.3
	.21	3.4	0.50	2.9	.12	0.5	.15	2.8	.12	1.6
26.9	11.00	64.3	42.10	35.6	19.07	40.0	36.84	67.4	19.82	58.7
	.28	3.3	0.87	2.8	.15	0.7	.20	2.9	.16	1.8
Oct. 6.9	11.28	61.0	42.97	32.8	19.22	39.3	37.04	64.5	19.98	56.9
	.34	3.3	1.22	2.5	.19	1.0	.24	2.9	.19	1.9
16.9	11.62	57.7	44.19	30.3	19.41	38.3	37.28	61.6	20.17	55.0
	.41	3.1	1.55	2.0	.23	1.3	.29	2.8	.23	2.1
26.9	12.03	54.6	45.74	28.3	19.64	37.0	37.57	58.8	20.40	52.9
	.47	2.9	1.80	1.5	.26	1.5	.33	2.8	.27	2.2
Nov. 5.8	12.50	51.7	47.54	26.8	19.90	35.5	37.90	56.0	20.67	50.7
	.53	2.5	2.01	0.9	.29	1.8	.37	2.6	.31	2.3
15.8	13.03	49.2	49.55	25.9	20.19	33.7	38.27	53.4	20.98	48.4
	.57	2.2	2.14	0.3	.32	2.0	.41	2.4	.33	2.3
25.8	13.60	47.0	51.69	25.6	20.51	31.7	38.68	51.0	21.31	46.1
	.61	1.8	2.18	0.4	.33	2.1	.43	2.0	.35	2.2
Dec. 5.8	14.21	45.2	53.87	26.0	20.84	29.6	39.11	49.0	21.66	43.9
	.61	1.2	2.16	1.0	.34	2.1	.44	1.7	.36	2.0
15.7	14.82	44.0	56.03	27.0	21.18	27.5	39.55	47.3	22.02	41.9
	.61	0.7	2.05	1.7	.33	2.1	.44	1.2	.35	1.9
25.7	15.43	43.3	58.08	28.7	21.51	25.4	39.99	46.1	22.37	40.0
	.59	0.1	1.88	2.2	.32	2.1	.43	0.8	.35	1.6
35.7	16.02	43.2	59.96	30.9	21.83	23.3	40.42	45.3	22.72	38.4



APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Ursæ Majoris.		δ Crateris.		τ Leonis.		λ Draconis.		ξ Hydræ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 11 13	° +33 34	h m 11 14	° -14 17	h m 11 23	° + 3 20	h m 11 26	° +69 49	h m 11 28	° -31 21
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 0.7	37.01	62.9	49.93	19.1	18.07	71.2	5.16	28.2	33.83	19.3
10.7	37.37	61.9	50.24	21.5	18.39	69.2	5.91	28.4	34.17	21.9
20.7	37.70	61.3	50.52	23.9	18.68	67.4	6.61	29.1	34.48	24.7
30.6	38.00	61.2	50.77	26.2	18.93	65.8	7.23	30.5	34.75	27.6
Feb. 9.6	38.24	61.5	50.97	28.4	19.15	64.4	7.75	32.3	34.97	30.5
19.6	38.44	62.2	51.13	30.5	19.32	63.3	8.16	34.5	35.15	33.3
Mar. 1.5	38.57	63.2	51.24	32.3	19.45	62.5	8.44	37.1	35.28	36.0
11.5	38.66	64.5	51.31	33.9	19.53	62.0	8.60	39.9	35.36	38.5
21.5	38.69	66.0	51.34	35.3	19.57	61.7	8.64	42.8	35.40	40.8
31.5	38.68	67.6	51.33	36.4	19.58	61.7	8.56	45.6	35.39	42.9
Apr. 10.4	38.63	69.2	51.29	37.2	19.55	61.8	8.37	48.3	35.35	44.7
20.4	38.54	70.8	51.23	37.8	19.50	62.1	8.09	50.8	35.29	46.2
30.4	38.43	72.2	51.15	38.1	19.43	62.5	7.74	52.9	35.20	47.4
May 10.4	38.31	73.5	51.05	38.3	19.34	63.0	7.33	54.6	35.09	48.3
20.3	38.17	74.6	50.95	38.2	19.25	63.5	6.88	55.9	34.97	48.8
30.3	38.03	75.5	50.84	37.9	19.15	64.1	6.41	56.6	34.84	49.0
June 9.3	37.90	76.0	50.73	37.4	19.05	64.7	5.93	56.8	34.70	48.9
19.2	37.77	76.3	50.63	36.8	18.96	65.3	5.46	56.5	34.56	48.4
29.2	37.65	76.3	50.53	36.0	18.87	65.9	5.02	55.7	34.43	47.7
July 9.2	37.55	76.0	50.44	35.1	18.79	66.5	4.62	54.4	34.30	46.7
19.2	37.47	75.4	50.36	34.1	18.72	67.0	4.26	52.6	34.19	45.5
29.1	37.40	74.5	50.30	33.0	18.66	67.4	3.96	50.4	34.09	44.0
Aug. 8.1	37.36	73.4	50.26	31.9	18.62	67.7	3.72	47.8	34.01	42.4
18.1	37.34	72.0	50.23	30.8	18.60	67.9	3.55	44.9	33.95	40.7
28.1	37.35	70.3	50.24	29.7	18.61	68.0	3.46	41.7	33.92	38.9
Sept. 7.0	37.40	68.5	50.27	28.8	18.64	67.9	3.46	38.3	33.93	37.2
17.0	37.48	66.4	50.34	28.1	18.70	67.5	3.54	34.8	33.98	35.6
27.0	37.60	64.1	50.44	27.6	18.80	66.9	3.71	31.2	34.07	34.1
Oct. 6.9	37.76	61.7	50.58	27.4	18.93	66.1	3.98	27.5	34.20	33.0
16.9	37.97	59.2	50.76	27.6	19.10	65.0	4.34	23.9	34.38	32.2
26.9	38.22	56.6	50.98	28.0	19.32	63.7	4.80	20.5	34.61	31.7
Nov. 5.9	38.50	54.0	51.24	28.9	19.56	62.1	5.34	17.3	34.89	31.7
15.8	38.83	51.5	51.53	30.1	19.84	60.3	5.97	14.5	35.20	32.2
25.8	39.18	49.1	51.85	31.6	20.15	58.3	6.66	12.0	35.54	33.2
Dec. 5.8	39.56	46.9	52.19	33.4	20.48	56.2	7.40	10.0	35.90	34.6
15.7	39.95	44.9	52.53	35.5	20.82	54.0	8.18	8.6	36.27	36.4
25.7	40.34	43.3	52.87	37.8	21.16	51.9	8.96	7.7	36.64	38.6
35.7	40.72	42.1	53.20	40.2	21.49	49.8	9.73	7.4	37.00	41.1

## FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♌ Leonis.			♊ Ursæ Majoris.			♈ Leonis.			♊ Ursæ Majoris.			♍ Virginis.		
	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m	s	°	h m	s	°	h m	s	°	h m	s	°	h m	s	°
	11 32	- 0 19		11 41	+ 48 16		11 44	+ 15 4		11 49	- 54 11		11 56	+ 7 6	
	s	"		s	"		s	"		s	"		s	"	
Jan. 0.7	19.89	31.2		17.97	33.0		27.66	30.4		6.00	31.8		15.01	60.4	
10.7	20.21	33.3	2.1	18.41	32.3	0.7	28.00	28.7	1.7	6.49	31.1	0.7	15.34	58.4	2.0
20.7	20.50	35.3	2.0	18.82	32.1	0.2	28.31	27.2	1.5	6.96	31.0	0.1	15.65	56.6	1.8
30.6	20.76	37.1	1.8	19.20	32.4	0.3	28.59	26.0	1.2	7.38	31.5	0.5	15.93	55.1	1.5
Feb. 9.6	20.98	38.7	1.6	19.52	33.2	0.8	28.83	25.2	0.8	7.74	32.6	1.1	16.17	53.8	1.3
			1.3			1.3			0.5			1.5			0.9
19.6	21.16	40.0		19.78	34.5		29.03	24.7		8.04	34.1		16.37	52.9	
Mar. 1.5	21.30	41.0	1.0	19.98	36.2	1.7	29.18	24.6	0.1	8.27	36.0	1.9	16.53	52.3	0.6
			0.8			2.0			0.1			2.2			0.4
11.5	21.39	41.8	0.5	20.11	38.2	2.1	29.29	24.7	0.5	8.43	38.2	2.4	16.65	51.9	0.1
21.5	21.44	42.3	0.3	20.18	40.3	2.3	29.35	25.2	0.6	8.51	40.6	2.5	16.72	51.8	0.2
31.5	21.46	42.6	0.1	20.19	42.6	2.3	29.37	25.8	0.8	8.53	43.1	2.4	16.76	52.0	0.4
						2.3									
Apr. 10.4	21.44	42.7	0.1	20.14	44.9	2.1	29.36	26.6	0.8	8.48	45.5	2.4	16.77	52.4	0.5
20.4	21.39	42.6	0.3	20.05	47.0	2.0	29.32	27.4	1.0	8.37	47.9	2.2	16.74	52.9	0.6
30.4	21.33	42.3	0.4	19.92	49.0	1.8	29.26	28.4	0.9	8.22	50.1	1.9	16.70	53.5	0.7
May 10.4	21.25	41.9	0.4	19.76	50.8	1.4	29.18	29.3	0.9	8.04	52.0	1.5	16.63	54.2	0.7
20.3	21.16	41.5	0.5	19.58	52.2	1.1	29.09	30.2	0.9	7.83	53.5	1.1	16.55	54.9	0.7
						1.1									
30.3	21.07	41.0	0.6	19.39	53.3	0.7	28.99	31.1	0.7	7.60	54.6	0.7	16.47	55.6	0.7
June 9.3	20.97	40.4	0.6	19.19	54.0	0.3	28.89	31.8	0.6	7.36	55.3	0.3	16.38	56.3	0.6
19.2	20.87	39.8	0.7	19.00	54.3	0.1	28.79	32.4	0.5	7.13	55.6	0.2	16.28	56.9	0.6
29.2	20.78	39.1	0.6	18.81	54.2	0.6	28.69	32.9	0.3	6.90	55.4	0.6	16.18	57.5	0.5
July 9.2	20.70	38.5	0.6	18.64	53.6	1.0	28.60	33.2	0.1	6.68	54.8	1.1	16.09	58.0	0.4
						1.0									
19.2	20.62	37.9	0.5	18.49	52.6	1.3	28.52	33.3	0.0	6.49	53.7	1.5	16.01	58.4	0.3
29.1	20.56	37.4	0.5	18.36	51.3	1.7	28.45	33.3	0.2	6.32	52.2	1.8	15.93	58.7	0.1
Aug. 8.1	20.52	36.9	0.4	18.25	49.6	2.0	28.39	33.1	0.4	6.18	50.4	2.2	15.87	58.8	0.0
18.1	20.49	36.5	0.2	18.18	47.6	2.3	28.35	32.7	0.6	6.07	48.2	2.6	15.82	58.8	0.2
28.1	20.48	36.3	0.1	18.14	45.3	2.6	28.34	32.1	0.8	6.01	45.6	2.8	15.80	58.6	0.4
						2.6									
Sept. 7.0	20.50	36.2	0.1	18.14	42.7	2.8	28.35	31.3	1.1	5.99	42.8	3.1	15.80	58.2	0.6
17.0	20.55	36.3	0.4	18.19	39.9	3.0	28.39	30.2	1.3	6.02	39.7	3.2	15.83	57.6	0.8
27.0	20.64	36.7	0.6	18.28	36.9	3.1	28.46	28.9	1.5	6.10	36.5	3.3	15.89	56.8	1.0
Oct. 6.9	20.77	37.3	0.9	18.42	33.8	3.1	28.58	27.4	1.7	6.24	33.2	3.4	15.99	55.8	1.3
16.9	20.93	38.2	1.1	18.62	30.7	3.2	28.73	25.7	2.0	6.44	29.8	3.3	16.13	54.5	1.6
						3.2									
26.9	21.13	39.3	1.4	18.87	27.5	3.1	28.93	23.7	2.1	6.71	26.5	3.3	16.32	52.9	1.8
Nov. 5.9	21.37	40.7	1.7	19.17	24.4	3.0	29.16	21.6	2.2	7.03	23.2	3.1	16.54	51.1	1.9
15.8	21.65	42.4	1.9	19.52	21.4	2.7	29.43	19.4	2.3	7.40	20.1	2.8	16.80	49.2	2.1
25.8	21.95	44.3	2.1	19.92	18.7	2.4	29.74	17.1	2.3	7.83	17.3	2.5	17.09	47.1	2.2
Dec. 5.8	22.28	46.4	2.1	20.35	16.3	2.0	30.07	14.8	2.2	8.30	14.8	2.0	17.41	44.9	2.3
						2.0									
15.7	22.62	48.5	2.2	20.80	14.3	1.6	30.41	12.6	2.2	8.79	12.8	1.5	17.75	42.6	2.2
25.7	22.96	50.7	2.2	21.26	12.7	1.1	30.76	10.4	1.9	9.30	11.3	1.0	18.09	40.4	2.1
35.7	23.29	52.9		21.71	11.6		31.10	8.5		9.80	10.3		18.43	38.3	

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Virginis.			ε Corvi.			δ Draconis (H.).			γ Corvi.			ζ Canum Venat.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	12	0	+ 9 13	12	5	-22 6	12	7	+78 6	12	11	-17 2	12	11	+41 9
Jan. 0.7	36.84		59.4	28.83		57.1	60.74		44.6	9.70		21.4	36.73		31.1
10.7	37.17	.33	57.4	29.17	.34	59.5	61.95	1.21	44.4	10.04	.34	23.7	37.14	.41	29.9
20.7	37.48	.31	55.7	29.49	.32	61.9	63.11	1.16	44.9	10.35	.31	26.1	37.53	.39	29.1
30.7	37.77	.29	54.3	29.78	.29	64.4	64.18	1.07	46.0	10.64	.29	28.4	37.89	.36	28.8
Feb. 9.6	38.01	.21	53.1	30.03	.21	66.9	65.12	0.94	47.6	10.90	.26	30.7	38.21	.32	29.1
19.6	38.22	.17	52.2	30.24	.17	69.3	65.91	0.79	49.7	11.11	.21	32.8	38.48	.27	29.9
Mar. 1.6	38.39	.12	51.7	30.41	.12	71.5	66.52	0.61	52.3	11.28	.17	34.8	38.70	.22	31.1
11.5	38.51	.08	51.5	30.53	.09	73.5	66.93	0.41	55.1	11.41	.13	36.6	38.86	.16	31.5
21.5	38.59	.04	51.6	30.62	.04	75.4	67.14	0.21	58.1	11.50	.09	38.1	38.96	.10	32.6
31.5	38.63	.01	51.9	30.66	.01	77.0	67.15	0.01	61.2	11.55	.05	39.4	39.01	.05	34.4
Apr. 10.5	38.64	.02	52.3	30.67	.02	78.4	66.96	0.19	64.1	11.57	.02	40.5	39.01	.00	36.4
20.4	38.62	.05	52.9	30.65	.04	79.5	66.60	0.36	66.9	11.56	.01	41.3	38.97	.04	38.5
30.4	38.57	.06	53.7	30.61	.07	80.3	66.08	0.52	69.4	11.52	.04	41.9	38.90	.07	40.6
May 10.4	38.51	.08	54.4	30.54	.08	80.9	65.44	0.64	71.5	11.47	.05	42.3	38.79	.11	42.6
20.4	38.43	.08	55.2	30.46	.09	81.3	64.60	0.75	73.1	11.39	.08	42.5	38.66	.13	44.4
30.3	38.35	.10	56.0	30.37	.10	81.5	63.87	0.82	74.3	11.31	.08	42.5	38.52	.14	46.0
June 9.3	38.25	.09	56.7	30.27	.11	81.4	63.01	0.86	74.9	11.21	.10	42.5	38.37	.15	47.4
19.3	38.16	.10	57.4	30.16	.12	81.0	62.13	0.88	74.9	11.11	.10	42.3	38.21	.16	48.4
29.2	38.06	.09	58.0	30.04	.11	80.5	61.25	0.84	74.4	11.01	.10	41.9	38.05	.16	49.0
July 9.2	37.97	.09	58.4	29.93	.11	79.8	60.41	0.79	73.4	10.90	.11	41.3	37.89	.16	49.3
19.2	37.88	.08	58.8	29.82	.10	78.9	59.62	0.72	71.8	10.80	.11	40.6	37.75	.16	49.2
29.2	37.80	.07	59.0	29.72	.09	77.8	58.90	0.63	69.8	10.70	.10	39.8	37.62	.13	48.7
Aug 8.1	37.73	.05	59.0	29.63	.07	76.7	58.27	0.52	67.3	10.62	.08	38.9	37.50	.12	47.9
18.1	37.68	.03	58.9	29.56	.05	75.4	57.75	0.40	64.4	10.55	.07	37.9	37.41	.09	46.7
28.1	37.65	.00	58.6	29.51	.02	74.2	57.35	0.28	61.2	10.50	.05	36.9	37.34	.07	45.1
Sept. 7.1	37.65	.03	58.1	29.49	.02	73.0	57.07	0.13	61.2	10.48	.02	35.9	37.31	.03	43.2
17.0	37.68	.06	57.4	29.51	.05	71.9	56.94	0.02	57.7	10.49	.01	35.0	37.31	.00	41.0
27.0	37.74	.09	56.5	29.56	.09	71.0	56.96	0.18	54.1	10.53	.04	34.2	37.36	.05	38.6
Oct. 7.0	37.83	.14	55.3	29.65	.14	70.3	57.14	0.34	50.3	10.62	.09	33.6	37.45	.09	35.9
16.9	37.97	.18	53.9	29.79	.18	69.9	57.48	0.51	46.4	10.75	.13	33.2	37.59	.14	33.0
26.9	38.15	.22	52.2	29.97	.23	69.8	57.99	0.66	42.5	10.92	.17	33.0	37.78	.19	30.0
Nov. 5.9	38.37	.25	50.4	30.20	.27	70.1	58.65	0.81	38.8	11.02	.22	33.2	37.98	.24	26.9
15.9	38.62	.29	48.3	30.47	.31	70.8	59.46	0.95	35.3	11.14	.26	33.8	38.02	.29	23.8
25.8	38.91	.32	46.1	30.78	.33	71.9	60.41	1.06	32.0	11.40	.30	34.7	38.31	.34	20.7
Dec. 5.8	39.23	.34	43.9	31.11	.35	73.3	61.47	1.15	29.2	11.70	.32	35.9	38.65	.37	17.8
15.8	39.57	.34	41.6	31.46	.36	75.1	62.62	1.20	26.8	12.02	.34	37.5	39.02	.40	15.1
25.8	39.91	.34	39.4	31.82	.35	77.1	63.82	1.21	24.9	12.36	.35	39.3	39.42	.41	12.7
35.7	40.25		37.3	32.17		79.4	65.03		23.7	12.71	.35	41.4	39.83	.42	10.7
									23.0	13.06		43.7	40.25		9.1

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Chamæleontis.		$\eta$ Virginis.		$\alpha^1$ Crucis.		$\delta$ Corvi.		$\beta$ Canum Venat.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 12 12	° ' " -78 48	h m 12 15	° ' " -0 9	h m 12 21	° ' " -62 35	h m 12 25	° ' " -16 0	h m 12 29	° ' " +41 50
Jan. 0.7	61.29 s	19.5 "	17.29 s	55.7 "	33.79 s	38.4 "	11.43 s	42.1 "	27.72 s	37.9 "
10.7	62.48 1.19	21.3 1.8	17.62 1.33	57.9 2.2	34.36 1.57	40.4 2.0	11.77 1.34	44.4 2.3	28.13 1.41	36.5 1.4
20.7	63.58 1.10	23.6 2.3	17.93 1.31	59.9 2.0	34.90 1.54	42.8 2.4	12.09 1.32	46.7 2.3	28.53 1.40	35.6 0.9
30.7	64.57 0.99	26.4 2.8	18.22 1.29	61.7 1.8	35.39 1.49	45.6 2.8	12.39 1.30	49.0 2.3	28.90 1.37	35.2 0.4
Feb. 9.6	65.42 0.85	29.6 3.2	18.47 1.25	63.3 1.6	35.82 1.43	48.8 3.2	12.65 1.26	51.2 2.2	29.23 1.33	35.3 0.1
	65.42 0.70	29.6 3.5	18.47 1.22	63.3 1.4	35.82 1.36	48.8 3.4	12.65 1.23	51.2 2.1	29.23 1.29	35.3 0.7
19.6	66.12 0.53	33.1 3.7	18.69 1.18	64.7 1.0	36.18 1.29	52.2 3.5	12.88 1.18	53.3 1.9	29.52 1.24	36.0 1.1
Mar. 1.6	66.65 0.36	36.8 3.8	18.87 1.13	65.7 0.8	36.47 1.21	55.7 3.6	13.06 1.15	55.2 1.7	29.76 1.18	37.1 1.5
11.5	67.01 0.19	40.6 3.9	19.00 1.09	66.5 0.5	36.68 1.14	59.3 3.5	13.21 1.10	56.9 1.5	29.94 1.13	38.6 1.8
21.5	67.20 0.02	44.5 3.8	19.09 1.06	67.0 0.3	36.82 1.06	62.8 3.5	13.31 1.07	58.4 1.2	30.07 1.07	40.4 2.1
31.5	67.22 0.15	48.3 3.7	19.15 1.02	67.3 0.1	36.88 1.00	66.3 3.3	13.38 1.04	59.6 1.0	30.14 1.02	42.5 2.2
Apr. 10.5	67.07 0.30	52.0 3.5	19.17 1.00	67.4 0.1	36.88 1.07	69.6 3.1	13.42 1.00	60.6 0.8	30.16 1.02	44.7 2.2
20.4	66.77 0.45	55.5 3.3	19.17 1.03	67.3 0.3	36.81 1.13	72.7 2.8	13.42 1.02	61.4 0.6	30.14 1.06	46.9 2.1
30.4	66.32 0.58	58.8 2.9	19.14 1.05	67.0 0.4	36.68 1.17	75.5 2.4	13.40 1.05	62.0 0.4	30.08 1.10	49.0 2.0
May 10.4	65.74 0.69	61.7 2.5	19.09 1.06	66.6 0.5	36.51 1.23	77.9 2.1	13.35 1.06	62.4 0.2	29.98 1.12	51.0 1.7
20.4	65.05 0.79	64.2 2.0	19.03 1.08	66.1 0.5	36.28 1.26	80.0 1.7	13.29 1.07	62.6 0.0	29.86 1.14	52.7 1.5
30.3	64.26 0.88	66.2 1.6	18.95 1.09	65.6 0.6	36.02 1.30	81.7 1.2	13.22 1.09	62.6 0.2	29.72 1.15	54.2 1.2
June 9.3	63.38 0.94	67.8 1.1	18.86 1.09	65.0 0.6	35.72 1.32	82.9 0.7	13.13 1.10	62.0 0.4	29.57 1.16	55.4 0.8
19.3	62.44 0.97	68.9 0.5	18.77 1.09	64.4 0.6	35.40 1.34	83.6 0.3	13.03 1.10	62.4 0.5	29.41 1.17	56.2 0.4
29.2	61.47 0.98	69.4 0.1	18.68 1.10	63.8 0.6	35.06 1.35	83.9 0.3	12.93 1.10	61.5 0.6	29.24 1.17	56.6 0.1
July 9.2	60.49 0.96	69.3 0.6	18.58 1.09	63.2 0.5	34.71 1.34	83.6 0.7	12.83 1.11	60.9 0.7	29.07 1.16	56.7 0.4
19.2	59.53 0.91	68.7 1.1	18.49 1.08	62.7 0.5	34.37 1.33	82.9 1.2	12.72 1.10	60.2 0.9	28.91 1.15	56.3 0.7
29.2	58.62 0.84	67.6 1.6	18.41 1.08	62.2 0.4	34.04 1.30	81.7 1.6	12.62 1.09	59.3 0.9	28.76 1.13	55.6 1.1
Aug. 8.1	57.78 0.73	66.0 2.1	18.33 1.06	61.8 0.3	33.74 1.27	80.1 1.9	12.53 1.08	58.4 0.9	28.63 1.12	54.5 1.5
18.1	57.05 0.59	63.9 2.5	18.27 1.04	61.5 0.2	33.47 1.21	78.2 2.3	12.45 1.06	57.5 0.9	28.51 1.09	53.0 1.8
28.1	56.46 0.43	61.4 2.7	18.23 1.02	61.3 0.1	33.26 1.16	75.9 2.5	12.39 1.03	56.6 0.8	28.42 1.06	51.2 2.2
Sept. 7.1	56.03 0.25	58.7 2.9	18.21 1.01	61.2 0.2	33.10 1.08	73.4 2.7	12.36 1.01	55.8 0.7	28.36 1.02	49.0 2.4
17.0	55.78 0.04	55.8 3.0	18.22 1.04	61.4 0.4	33.02 1.01	70.7 2.6	12.35 1.03	55.1 0.6	28.34 1.02	46.6 2.7
27.0	55.74 0.17	52.8 2.9	18.26 1.08	61.8 0.6	33.03 1.09	68.1 2.6	12.38 1.07	54.5 0.3	28.36 1.06	43.9 2.9
Oct. 7.0	55.91 0.38	49.9 2.8	18.34 1.12	62.4 0.9	33.12 1.18	65.5 2.4	12.45 1.12	54.2 0.1	28.42 1.11	41.0 3.1
16.9	56.29 0.58	47.1 2.5	18.46 1.17	63.3 1.1	33.30 1.27	63.1 2.1	12.57 1.16	54.1 0.2	28.53 1.17	37.9 3.1
26.9	56.87 0.78	44.6 2.1	18.63 1.21	64.4 1.4	33.57 1.36	61.0 1.7	12.73 1.21	54.3 0.6	28.70 1.22	34.8 3.2
Nov. 5.9	57.65 0.94	42.5 1.7	18.84 1.24	65.8 1.7	33.93 1.44	59.3 1.2	12.94 1.25	54.9 0.9	28.92 1.27	31.6 3.2
15.9	58.59 1.08	40.8 1.1	19.08 1.28	67.5 1.9	34.37 1.51	58.1 0.7	13.19 1.28	55.8 1.2	29.19 1.32	28.4 3.1
25.8	59.67 1.18	39.7 0.5	19.36 1.31	69.4 2.1	34.88 1.55	57.4 0.0	13.47 1.32	57.0 1.6	29.51 1.35	25.3 2.8
Dec. 5.8	60.85 1.24	39.2 0.1	19.67 1.34	71.5 2.1	35.43 1.59	57.4 0.5	13.79 1.33	58.6 1.8	29.86 1.39	22.5 2.5
15.8	62.09 1.25	39.3 0.8	20.01 1.34	73.6 2.2	36.02 1.60	57.9 1.1	14.12 1.35	60.4 2.0	30.25 1.41	20.0 2.2
25.8	63.34 1.23	40.1 1.5	20.35 1.33	75.8 2.2	36.62 1.59	59.0 1.6	14.47 1.35	62.4 2.2	30.66 1.42	17.8 1.7
35.7	64.57	41.6	20.68	78.0	37.21	60.6	14.82	64.6	31.08	16.1

# FIXED STARS, 1910.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Draconis.		$\beta$ Corvi.		$\gamma$ Virginis (mean).		31 Comæ Berenices.		32 <sup>a</sup> Camelop. (H.).	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 12 29	° ' " +70 16	h m 12 29	° ' " -22 53	h m 12 37	° ' " -05 57	h m 12 47	° ' " +28 1	h m 12 48	° ' " +83 53
Jan. 0.7	38.85	49.2	38.40	44.7	5.09	16.9	18.11	43.4	28.64	52.3
10.7	39.63	48.5	38.75	46.9	5.42	19.0	18.48	41.5	30.86	51.7
20.7	40.39	48.4	39.08	49.3	5.74	21.1	18.83	40.0	33.06	51.7
30.7	41.10	48.9	39.39	51.7	6.04	22.9	19.17	39.0	35.16	52.4
Feb. 9.6	41.74	50.1	39.66	54.1	6.30	24.6	19.47	38.5	37.09	53.7
19.6	42.29	51.8	39.90	56.5	6.53	26.0	19.74	38.4	38.78	55.5
Mar. 1.6	42.74	54.0	40.09	58.7	6.73	27.1	19.96	38.8	40.18	57.8
11.6	43.07	56.6	40.24	60.8	6.88	28.0	20.14	39.5	41.23	60.5
21.5	43.28	59.4	40.35	62.7	7.00	28.6	20.28	40.6	41.91	63.5
31.5	43.36	62.4	40.43	64.3	7.08	28.9	20.37	42.0	42.21	66.6
Apr. 10.5	43.33	65.3	40.47	65.7	7.12	29.0	20.42	43.5	42.13	69.7
20.4	43.19	68.2	40.47	66.9	7.14	28.9	20.43	45.2	41.67	72.6
30.4	42.96	70.8	40.45	67.9	7.13	28.7	20.42	46.9	40.88	75.4
May 10.4	42.64	73.1	40.41	68.6	7.09	28.3	20.37	48.5	39.78	77.8
20.4	42.25	75.0	40.35	69.1	7.04	27.8	20.30	50.0	38.43	79.8
30.3	41.81	76.5	40.27	69.3	6.98	27.3	20.21	51.4	36.87	81.3
June 9.3	41.34	77.5	40.17	69.4	6.90	26.7	20.10	52.6	35.16	82.3
19.3	40.84	78.0	40.07	69.2	6.81	26.1	19.99	53.6	33.35	82.8
29.3	40.34	78.0	39.96	68.8	6.72	25.5	19.87	54.3	31.49	82.7
July 9.2	39.84	77.4	39.85	68.2	6.62	24.9	19.75	54.6	29.63	82.0
19.2	39.37	76.3	39.73	67.4	6.52	24.4	19.62	54.7	27.82	80.8
29.2	38.93	74.7	39.62	66.5	6.43	23.9	19.50	54.5	26.11	79.1
Aug. 8.1	38.53	72.6	39.51	65.4	6.34	23.5	19.39	54.0	24.53	76.9
18.1	38.19	70.1	39.42	64.3	6.26	23.1	19.29	53.2	23.11	74.3
28.1	37.91	67.3	39.35	63.1	6.20	22.9	19.20	52.0	21.90	71.3
Sept. 7.1	37.70	64.1	39.31	62.0	6.16	22.9	19.14	50.6	20.92	67.9
17.0	37.57	60.6	39.30	60.9	6.15	23.0	19.11	48.9	20.20	64.3
27.0	37.54	57.0	39.32	60.0	6.17	23.3	19.12	46.9	19.75	60.5
Oct. 7.0	37.60	53.2	39.39	59.2	6.23	23.9	19.16	44.7	19.61	56.6
17.0	37.76	49.4	39.51	58.7	6.33	24.7	19.25	42.2	19.78	52.7
26.9	38.03	45.6	39.67	58.5	6.47	25.8	19.39	39.5	20.27	48.8
Nov. 5.9	38.41	41.9	39.88	58.7	6.66	27.2	19.57	36.8	21.08	45.1
15.9	38.88	38.4	40.14	59.2	6.89	28.8	19.80	34.0	22.21	41.6
25.8	39.45	35.3	40.43	60.1	7.15	30.6	20.07	31.1	23.63	38.4
Dec. 5.8	40.10	32.5	40.75	61.4	7.45	32.6	20.38	28.3	25.31	35.6
15.8	40.82	30.2	41.10	63.0	7.77	34.8	20.72	25.7	27.22	33.4
25.8	41.58	28.5	41.46	64.9	8.11	37.0	21.08	23.3	29.29	31.7
35.7	42.36	27.3	41.82	67.1	8.44	39.2	21.45	21.2	31.46	30.6

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Canum Venat.			δ Muscæ.			γ Virginis.			η Virginis.			20 Canum Venat.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	12	51	38 47	12	56	71 3	12	57	11 26	13	5	5 3	13	13	41 2
	s		"	s		"	s		"	s		"	s		"
Jan. 0.8	48.39		66.6	1.59		25.1	40.83		33.3	16.19		26.2	29.66		37.0
		.40	1.7		.80	1.3		.34	2.1		.34	2.1		.41	1.9
10.7	48.79		64.9	2.39		26.4	41.17		31.2	16.53		28.3	30.07		35.1
		.39	1.2		.77	1.9		.33	1.8		.33	2.1		.40	1.4
20.7	49.18		63.7	3.16		28.3	41.50		29.4	16.86		30.4	30.47		33.7
		.37	0.7		.73	2.4		.31	1.6		.31	2.0		.39	0.5
30.7	49.55		63.0	3.89		30.7	41.81		27.8	17.17		32.4	30.86		32.9
		.34	0.2		.66	2.8		.28	1.2		.29	1.7		.36	0.2
Feb. 9.7	49.89		62.8	4.55		33.5	42.09		26.6	17.46		34.1	31.22		32.7
		.30	0.4		.57	3.1		.25	0.9		.25	1.6		.32	0.3
	50.19		63.2	5.12		36.6	42.34		25.7	17.71		35.7	31.54		33.0
		.25	0.9		.48	3.4		.22	0.5		.22	1.4		.27	0.8
Mar. 1.6	50.44		64.1	5.60		40.0	42.56		25.2	17.93		37.1	31.81		33.8
		.20	1.2		.39	3.5		.18	0.2		.18	1.1		.23	1.2
11.6	50.64		65.3	5.99		43.5	42.74		25.0	18.11		38.2	32.04		35.0
		.15	1.7		.29	3.7		.14	0.1		.14	0.8		.18	1.7
21.5	50.79		67.2	6.28		47.2	42.88		25.1	18.25		39.0	32.22		36.7
		.10	1.9		.18	3.6		.10	0.4		.11	0.5		.13	2.0
31.5	50.89		68.9	6.46		50.8	42.98		25.5	18.36		39.5	32.35		38.7
		.05	2.0		.09	3.6		.06	0.7		.08	0.4		.08	2.1
	50.94		70.9	6.55		54.4	43.04		26.2	18.44		39.9	32.43		40.8
		.01	2.1		.01	3.4		.03	0.8		.04	0.1		.03	2.2
Apr. 10.5	50.95		73.0	6.54		57.8	43.07		27.0	18.48		40.0	32.46		43.0
		.03	2.1		.10	3.3		.00	0.9		.02	0.0		.01	2.3
20.5	50.92		75.1	6.44		61.1	43.07		27.9	18.50		40.0	32.45		45.3
		.07	2.1		.18	3.0		.02	1.0		.01	0.2		.05	2.2
May 10.4	50.85		77.2	6.26		64.1	43.05		28.9	18.49		39.8	32.40		47.5
		.09	1.8		.26	2.6		.04	1.0		.03	0.3		.08	2.1
20.4	50.76		79.0	6.00		66.7	43.01		29.9	18.46		39.5	32.32		49.6
		.11	1.6		.34	2.3		.06	1.0		.04	0.4		.10	1.8
	50.65		80.6	5.66		69.0	42.95		30.9	18.42		39.1	32.22		51.4
		.13	1.4		.40	1.8		.07	1.0		.07	0.5		.13	1.5
June 9.3	50.52		82.0	5.26		70.8	42.88		31.9	18.35		38.6	32.09		52.9
		.15	1.0		.45	1.4		.09	0.8		.07	0.5		.15	1.2
19.3	50.37		83.0	4.81		72.2	42.79		32.7	18.28		38.1	31.94		54.1
		.15	0.6		.49	0.8		.09	0.7		.09	0.5		.16	0.9
29.3	50.22		83.6	4.32		73.0	42.70		33.4	18.19		37.6	31.78		55.0
		.16	0.3		.52	0.4		.10	0.6		.10	0.6		.17	0.4
July 9.2	50.06		83.9	3.80		73.4	42.60		34.0	18.09		37.0	31.61		55.4
		.16	0.1		.53	0.2		.11	0.4		.10	0.5		.18	0.1
	49.90		83.8	3.27		73.2	42.49		34.4	17.99		36.5	31.43		55.5
		.15	0.5		.53	0.7		.11	0.2		.11	0.6		.17	0.4
19.2	49.75		83.3	2.74		72.5	42.38		34.6	17.88		35.9	31.26		55.1
		.14	0.8		.51	1.2		.10	0.1		.10	0.5		.16	0.8
Aug. 8.2	49.61		82.5	2.23		71.3	42.28		34.7	17.78		35.4	31.10		54.3
		.13	1.2		.47	1.6		.09	0.2		.10	0.4		.16	1.1
18.1	49.48		81.3	1.76		69.7	42.19		34.5	17.68		35.0	30.94		53.2
		.11	1.6		.40	2.0		.08	0.3		.08	0.4		.13	1.6
28.1	49.37		79.7	1.36		67.7	42.11		34.2	17.60		34.6	30.81		51.6
		.08	2.0		.33	2.4		.06	0.6		.06	0.2		.11	1.9
	49.29		77.7	1.03		65.3	42.05		33.6	17.54		34.4	30.70		49.7
		.05	2.2		.23	2.6		.03	0.8		.04	0.1		.08	2.2
Sept. 7.1	49.24		75.5	0.80		62.7	42.02		32.8	17.50		34.3	30.62		47.5
		.01	2.5		.11	2.8		.00	1.1		.00	0.1		.05	2.6
17.1	49.23		73.0	0.69		59.9	42.02		31.7	17.50		34.4	30.57		44.9
		.04	2.7		.01	2.8		.04	1.3		.03	0.3		.00	2.8
Oct. 7.0	49.27		70.3	0.70		57.1	42.06		30.4	17.53		34.7	30.57		42.1
		.08	3.0		.14	2.7		.08	1.5		.07	0.6		.05	3.0
17.0	49.35		67.3	0.84		54.4	42.14		28.9	17.60		35.3	30.62		39.1
		.13	3.1		.27	2.6		.12	1.8		.12	0.8		.11	3.2
	49.48		64.2	1.11		51.8	42.26		27.1	17.72		36.1	30.73		35.9
		.19	3.2		.10	2.2		.17	2.0		.16	1.1		.16	3.3
Nov. 5.9	49.67		61.0	1.51		49.6	42.43		25.1	17.88		37.2	30.89		32.6
		.24	3.2		.52	1.8		.21	2.2		.21	1.3		.21	3.4
15.9	49.91		57.8	2.03		47.8	42.64		22.9	18.09		38.5	31.10		29.2
		.28	3.1		.62	1.4		.25	2.3		.25	1.6		.27	3.3
25.9	50.19		54.7	2.65		46.4	42.89		20.6	18.34		40.1	31.37		25.9
		.33	3.0		.71	0.8		.29	2.4		.29	1.9		.32	3.1
Dec. 5.8	50.52		51.7	3.36		45.6	43.18		18.2	18.63		42.0	31.69		22.8
		.37	2.7		.77	0.2		.31	2.4		.31	2.0		.35	2.9
	50.89		49.0	4.13		45.4	43.49		15.8	18.94		44.0	32.04		19.9
		.38	2.4		.81	0.4		.34	2.4		.34	2.1		.39	2.6
15.8	51.27		46.6	4.94		45.8	43.83		13.4	19.28		46.1	32.43		17.3
		.40	2.0		.81	1.0		.34	2.2		.34	2.1		.40	2.1
25.8	51.67		44.6	5.75		46.8	44.17		11.2	19.62		48.2	32.83		15.2

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>a</i> Virginis. ( <i>Spica</i> .)		<i>κ</i> Octantis.		<i>ζ</i> Virginis.		B. A. C. 4536.		<i>m</i> Virginis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 13 20 s	° ' " —10 41 "	h m 13 25 s	° ' " —85 19 "	h m 13 30 s	° ' " — 0 8 "	h m 13 30 s	° ' " +37 38 "	h m 13 36 s	° ' " — 8 14 "
Jan. 0.8	25.75 .34	23.4 2.1	62.47 2.92	7.5 0.6	5.12 .33	6.6 2.1	45.76 .38	27.0 2.1	51.86 .34	51.3 2.1
10.8	26.09 .33	25.5 2.1	65.39 2.89	8.1 1.2	5.45 .33	8.7 2.0	46.14 .39	24.9 1.6	52.20 .33	53.4 2.0
20.7	26.42 .32	27.6 2.1	68.28 2.77	9.3 1.7	5.78 .32	10.7 1.9	46.53 .38	23.3 1.0	52.53 .32	55.4 2.0
30.7	26.74 .30	29.7 1.9	71.05 2.58	11.0 2.3	6.10 .30	12.6 1.7	46.91 .35	22.3 0.5	52.85 .30	57.4 1.8
Feb. 9.7	27.04 .26	31.6 1.7	73.63 2.34	13.3 2.7	6.40 .27	14.3 1.3	47.26 .32	21.8 0.0	53.15 .28	59.2 1.7
19.6	27.30 .23	33.3 1.6	75.97 2.04	16.0 3.1	6.67 .24	15.6 1.1	47.58 .28	21.8 0.5	53.43 .24	60.9 1.4
Mar. 1.6	27.53 .20	34.9 1.4	78.01 1.71	19.1 3.4	6.91 .20	16.7 0.9	47.86 .24	22.3 1.0	53.67 .21	62.3 1.2
11.6	27.73 .16	36.3 1.1	79.72 1.35	22.5 3.6	7.11 .17	17.6 0.5	48.10 .20	23.3 1.5	53.88 .18	63.5 1.0
21.6	27.89 .13	37.4 0.8	81.07 0.96	26.1 3.8	7.28 .13	18.1 0.2	48.30 .14	24.8 1.7	54.06 .14	64.5 0.7
31.6	28.02 .09	38.2 0.7	82.03 0.57	29.9 3.8	7.41 .10	18.3 0.1	48.44 .10	26.5 2.0	54.20 .11	65.2 0.5
Apr. 10.5	28.11 .06	38.9 0.5	82.60 0.18	33.7 3.7	7.51 .06	18.4 0.2	48.54 .06	28.5 2.2	54.31 .07	65.7 0.3
20.5	28.17 .03	39.4 0.3	82.78 0.22	37.4 3.7	7.57 .04	18.2 0.4	48.60 .01	30.7 2.2	54.38 .05	66.0 0.1
30.5	28.20 .01	39.7 0.1	82.56 0.61	41.1 3.5	7.61 .01	17.8 0.4	48.61 .02	32.9 2.2	54.43 .02	66.1 0.0
May 10.4	28.21 .02	39.8 0.0	81.95 0.99	44.6 3.3	7.62 .01	17.4 0.6	48.59 .06	35.1 2.0	54.45 .00	66.1 0.1
20.4	28.19 .04	39.8 0.1	80.96 1.33	47.9 2.9	7.61 .03	16.8 0.6	48.53 .08	37.1 1.9	54.45 .02	66.0 0.3
30.4	28.15 .05	39.7 0.3	79.63 1.65	50.8 2.5	7.58 .05	16.2 0.6	48.45 .11	39.0 1.6	54.43 .05	65.7 0.3
June 9.3	28.10 .07	39.4 0.4	77.98 1.92	53.3 2.1	7.53 .07	15.6 0.7	48.34 .12	40.6 1.4	54.38 .06	65.4 0.4
19.3	28.03 .09	39.0 0.4	76.06 2.14	55.4 1.6	7.46 .08	14.9 0.6	48.22 .14	42.0 1.0	54.32 .08	65.0 0.5
29.3	27.94 .10	38.6 0.5	73.92 2.31	57.0 1.1	7.38 .09	14.3 0.6	48.08 .16	43.0 0.6	54.24 .10	64.5 0.5
July 9.3	27.84 .10	38.1 0.5	71.61 2.41	58.1 0.5	7.29 .11	13.7 0.6	47.92 .16	43.6 0.3	54.14 .10	64.0 0.5
19.2	27.74 .11	37.6 0.6	69.20 2.44	58.6 0.0	7.18 .11	13.1 0.4	47.76 .17	43.9 0.2	54.04 .11	63.5 0.5
29.2	27.63 .11	37.0 0.6	66.76 2.39	58.6 0.6	7.07 .11	12.7 0.4	47.59 .16	43.7 0.5	53.93 .12	63.0 0.6
Aug. 8.2	27.52 .11	36.4 0.6	64.37 2.26	58.0 1.2	6.96 .10	12.3 0.3	47.43 .16	43.2 0.9	53.81 .11	62.4 0.5
18.2	27.41 .09	35.8 0.5	62.11 2.04	56.8 1.7	6.86 .10	12.0 0.1	47.27 .14	42.3 1.3	53.70 .10	61.9 0.4
28.1	27.32 .08	35.3 0.5	60.07 1.75	55.1 2.2	6.76 .08	11.9 0.0	47.13 .12	41.0 1.7	53.60 .09	61.5 0.3
Sept. 7.1	27.24 .05	34.8 0.4	58.32 1.39	52.9 2.5	6.68 .06	11.9 0.2	47.01 .10	39.3 2.0	53.51 .07	61.2 0.2
17.1	27.19 .02	34.4 0.2	56.93 0.96	50.4 2.8	6.62 .03	12.1 0.3	46.91 .06	37.3 2.3	53.44 .03	61.0 0.1
27.0	27.17 .01	34.2 0.0	55.97 0.49	47.6 2.9	6.59 .00	12.4 0.6	46.85 .01	35.0 2.6	53.41 .00	60.9 0.1
Oct. 7.0	27.18 .06	34.2 0.2	55.48 0.02	44.7 3.1	6.59 .05	13.0 0.8	46.84 .03	32.4 2.9	53.41 .04	61.0 0.3
17.0	27.24 .11	34.4 0.4	55.50 0.53	41.6 2.9	6.64 .09	13.8 1.1	46.87 .08	29.5 3.1	53.45 .09	61.3 0.6
27.0	27.35 .15	34.8 0.8	56.03 1.05	38.7 2.8	6.73 .14	14.9 1.4	46.95 .13	26.4 3.2	53.54 .14	61.9 0.8
Nov. 5.9	27.50 .20	35.6 1.0	57.08 1.53	35.9 2.5	6.87 .18	16.3 1.5	47.08 .19	23.2 3.3	53.68 .18	62.7 1.1
15.9	27.70 .24	36.6 1.3	58.61 1.96	33.4 2.1	7.05 .23	17.8 1.8	47.27 .24	19.9 3.2	53.86 .23	63.8 1.4
25.9	27.94 .28	37.9 1.5	60.57 2.33	31.3 1.6	7.28 .27	19.6 2.0	47.51 .29	16.7 3.2	54.09 .26	65.2 1.6
Dec. 5.9	28.22 .31	39.4 1.8	62.90 2.61	29.7 1.0	7.55 .30	21.6 2.1	47.80 .33	13.5 3.0	54.35 .30	66.8 1.8
15.8	28.53 .34	41.2 1.9	65.51 2.81	28.7 0.4	7.85 .32	23.7 2.2	48.13 .36	10.5 2.7	54.65 .33	68.6 2.0
25.8	28.87 .34	43.1 2.1	68.32 2.92	28.3 0.2	8.17 .33	25.9 2.2	48.49 .39	7.8 2.3	54.98 .33	70.6 2.0
35.8	29.21	45.2	71.24	28.5	8.50	28.1	48.88	5.5	55.31	72.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\gamma$ Ursæ Majoris.		$\eta$ Bootis.		$\theta$ Apodis.		$\beta$ Centauri.		$\pi$ Hydræ.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 13 43	° +49 45	h m 13 50	° +18 50	h m 13 56	° -76 21	h m 13 57	° -59 56	h m 14 1	° -26 14
	s	"	s	"	s	"	s	"	s	"
Jan. 0.8	58.68		22.73		27.08		25.28		12.92	
10.8	59.12	.44	23.07	.34	28.18	1.10	25.85	.57	13.29	.37
20.8	59.57	.45	23.41	.34	29.28	1.10	26.42	.57	13.65	.36
30.7	60.01	.44	23.74	.33	30.35	1.07	26.98	.56	14.00	.35
Feb. 9.7	60.43	.42	24.06	.32	31.38	1.03	27.51	.53	14.34	.34
		.38		.29		.95		.49		.31
19.7	60.81		24.35		32.33		28.00		14.65	
Mar. 1.6	61.16	.35	24.61	.26	33.19	0.86	28.45	.45	14.93	.28
11.6	61.45	.29	24.84	.23	33.94	0.75	28.84	.39	15.18	.25
21.6	61.68	.23	25.03	.19	34.58	0.64	29.17	.33	15.39	.21
31.6	61.86	.18	25.18	.15	35.09	0.57	29.44	.27	15.57	.18
		.12		.12		.36		.21		.15
Apr. 10.5	61.98		25.30		35.47		29.65		15.72	
20.5	62.05	.07	25.38	.08	35.71	0.24	29.81	.16	15.83	.11
30.5	62.06	.01	25.43	.05	35.82	0.11	29.90	.09	15.91	.08
May 10.5	62.03	.03	25.45	.02	35.80	0.02	29.93	.03	15.96	.05
20.4	61.95	.08	25.45	.00	35.65	0.15	29.91	.02	15.98	.02
		.12		.03		.28		.08		.01
30.4	61.83		25.42		35.37		29.83		15.97	
June 9.4	61.68	.15	25.36	.06	34.98	0.39	29.70	.13	15.94	.03
19.3	61.50	.18	25.29	.07	34.48	0.50	29.52	.18	15.88	.06
29.3	61.30	.20	25.20	.09	33.88	0.60	29.29	.23	15.80	.08
July 9.3	61.08	.22	25.09	.11	33.20	0.68	29.03	.26	15.70	.10
		.23		.12		.73		.29		.12
19.3	60.85		24.97		32.47		28.74		15.58	
29.2	60.62	.23	24.84	.13	31.70	0.77	28.43	.31	15.44	.14
Aug. 8.2	60.39	.23	24.71	.13	30.92	0.78	28.11	.32	15.30	.14
18.2	60.16	.23	24.59	.12	30.16	0.76	27.80	.31	15.16	.14
28.2	59.96	.20	24.47	.12	29.45	0.71	27.50	.30	15.03	.13
		.18		.11		.63		.26		.12
Sept. 7.1	59.78		24.36		28.82		27.24		14.91	
17.1	59.63	.15	24.28	.08	28.29	0.53	27.02	.22	14.81	.10
27.1	59.52	.11	24.22	.06	27.90	0.39	26.87	.15	14.74	.07
Oct. 7.0	59.46	.06	24.20	.02	27.66	0.24	26.79	.08	14.72	.02
17.0	59.45	.01	24.22	.02	27.60	0.06	26.79	.00	14.74	.02
		.05		.06		.11		.09		.07
27.0	59.50		24.28		27.71		26.88		14.81	
Nov. 6.0	59.62	.12	24.39	.11	28.02	0.31	27.06	.18	14.93	.12
15.9	59.80	.18	24.55	.16	28.51	0.49	27.33	.27	15.10	.17
25.9	60.05	.25	24.76	.21	29.16	0.65	27.69	.36	15.33	.23
Dec. 5.9	60.36	.31	25.01	.25	29.96	0.80	28.12	.43	15.61	.28
		.36		.29		.93		.49		.31
15.8	60.72		25.30		30.89		28.61		15.92	
25.8	61.12	.40	25.61	.31	31.91	1.02	29.15	.54	16.26	.34
35.8	61.55	.43	25.95	.34	32.99	1.08	29.72	.57	16.62	.36



# FIXED STARS, 1910.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Draconis.			$\delta$ Bootis.			$\kappa$ Virginis.			$\gamma$ Ursæ Minoris.			$\alpha$ Bootis. (Arcturus.)		
	Right Ascension.	Declina- tion North.		Right Ascension	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.	
	h m 14 1	° 64 47		h m 14 6	° +25 30		h m 14 8	° - 9 51		h m 14 9	° +77 57		h m 14 11	° +19 38	
	s "	"		s "	"		s "	"		s "	"		s "	"	
Jan. 0.8	55.95	66.5	2.1	16.51	57.3	2.4	4.06	13.5	1.9	9.46	57.9	1.8	32.00	57.8	2.4
10.8	56.54	64.4	1.4	16.85	54.9	2.0	4.39	15.4	1.9	10.53	56.1	1.3	32.33	55.4	2.1
20.8	57.15	63.0	0.8	17.20	52.9	1.6	4.73	17.3	1.9	11.65	54.8	0.6	32.67	53.3	1.7
30.7	57.77	62.2	0.1	17.55	51.3	1.1	5.06	19.2	1.8	12.80	54.2	0.1	33.00	51.6	1.4
Feb. 9.7	58.36	62.1	0.6	17.88	50.2	0.6	5.37	21.0	1.7	13.93	54.3	0.7	33.32	50.2	0.9
19.7	58.92	62.7	1.2	18.19	49.6	0.1	5.66	22.7	1.4	15.00	55.0	1.4	33.62	49.3	0.4
Mar. 1.7	59.42	63.9	1.7	18.47	49.5	0.3	5.93	24.1	1.2	15.97	56.4	1.9	33.90	48.9	0.0
11.6	59.86	65.6	2.2	18.72	49.8	0.8	6.17	25.3	1.0	16.81	58.3	2.4	34.14	48.9	0.4
21.6	60.22	67.8	2.5	18.93	50.6	1.1	6.37	26.3	0.7	17.50	60.7	2.7	34.35	49.3	0.8
31.6	60.49	70.3	2.8	19.10	51.7	1.4	6.54	27.0	0.6	18.01	63.4	3.0	34.52	50.1	1.0
Apr. 10.5	60.67	73.1	3.0	19.23	53.1	1.6	6.68	27.6	0.3	18.34	66.4	3.1	34.65	51.1	1.3
20.5	60.77	76.1	3.0	19.33	54.7	1.8	6.79	27.9	0.2	18.48	69.5	3.1	34.75	52.4	1.5
30.5	60.78	79.1	2.9	19.39	56.5	1.8	6.87	28.1	0.0	18.44	72.6	2.9	34.82	53.9	1.5
May 10.5	60.70	82.0	2.7	19.42	58.3	1.8	6.92	28.1	0.1	18.22	75.5	2.8	34.86	55.4	1.5
20.4	60.56	84.7	2.4	19.42	60.1	1.8	6.95	28.0	0.2	17.83	78.3	2.4	34.87	56.9	1.5
30.4	60.34	87.1	2.1	19.39	61.9	1.6	6.95	27.8	0.3	17.30	80.7	2.0	34.85	58.4	1.5
June 9.4	60.07	89.2	1.7	19.34	63.5	1.4	6.93	27.5	0.3	16.64	82.7	1.6	34.81	59.9	1.2
19.4	59.75	90.9	1.2	19.26	64.9	1.2	6.88	27.2	0.4	15.87	84.3	1.1	34.74	61.1	1.1
29.3	59.39	92.1	0.7	19.16	66.1	0.9	6.82	26.8	0.4	15.01	85.4	0.6	34.65	62.2	0.8
July 9.3	59.00	92.8	0.2	19.05	67.0	0.6	6.73	26.4	0.5	14.09	86.0	0.0	34.55	63.0	0.6
19.3	58.59	93.0	0.3	18.92	67.6	0.4	6.63	25.9	0.5	13.14	86.0	0.5	34.43	63.6	0.4
29.2	58.17	92.7	0.9	18.78	68.0	0.0	6.51	25.4	0.5	12.17	85.5	1.0	34.30	64.0	0.1
Aug. 8.2	57.75	91.8	1.4	18.63	68.0	0.4	6.39	24.9	0.4	11.21	84.5	1.5	34.16	64.1	0.2
18.2	57.35	90.4	1.8	18.48	67.6	0.6	6.27	24.5	0.4	10.28	83.0	2.0	34.02	63.9	0.5
28.2	56.97	88.6	2.3	18.34	67.0	1.0	6.15	24.1	0.4	9.40	81.0	2.5	33.88	63.4	0.8
Sept. 7.1	56.62	86.3	2.7	18.22	66.0	1.3	6.04	23.7	0.3	8.59	78.5	2.9	33.76	62.6	1.1
17.1	56.32	83.6	3.0	18.11	64.7	1.6	5.95	23.4	0.1	7.87	75.6	3.2	33.65	61.5	1.4
27.1	56.08	80.6	3.4	18.03	63.1	2.0	5.89	23.3	0.0	7.27	72.4	3.5	33.57	60.1	1.7
Oct. 7.1	55.90	77.2	3.6	17.98	61.1	2.2	5.86	23.3	0.2	6.81	68.9	3.7	33.52	58.4	1.9
17.0	55.80	73.6	3.8	17.98	58.9	2.5	5.87	23.5	0.5	6.50	65.2	3.9	33.52	56.5	2.2
27.0	55.79	69.8	3.9	18.02	56.4	2.7	5.93	24.0	0.6	6.35	61.3	4.0	33.56	54.3	2.5
Nov. 6.0	55.87	65.9	3.9	18.11	53.7	2.8	6.03	24.6	1.0	6.38	57.3	3.9	33.64	51.8	2.6
15.9	56.05	62.0	3.8	18.26	50.9	2.9	6.19	25.6	1.2	6.60	53.4	3.8	33.78	49.2	2.8
25.9	56.32	58.2	3.6	18.45	48.0	3.0	6.39	26.8	1.4	7.00	49.6	3.6	33.96	46.4	2.8
Dec. 5.9	56.69	54.6	3.3	18.69	45.0	2.9	6.64	28.2	1.6	7.58	46.0	3.2	34.19	43.6	2.8
15.9	57.13	51.3	2.9	18.97	42.1	2.8	6.92	29.8	1.8	8.32	42.8	2.8	34.46	40.8	2.7
25.8	57.64	48.4	2.4	19.29	39.3	2.5	7.23	31.6	1.9	9.21	40.0	2.2	34.77	38.1	2.5
35.8	58.20	46.0		19.62	36.8		7.56	33.5		10.22	37.8		35.09	35.6	

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Octantis.		$\gamma$ Bootis.		$\lambda$ Virginis.		$\theta$ Bootis.		$\epsilon$ Ursæ Minoris.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 14 12	° 83 15	h m 14 12	° 46 29	h m 14 14	° 12 57	h m 14 22	° 52 15	h m 14 27	° 76 5
	s	"	s	"	s	"	s	"	s	"
Jan. 0.8	14.20	2.0	56.53	53.2	12.64	20.1	6.66	46.8	40.28	31.1
10.8	16.27	2.07	56.93	50.8	12.98	21.9	7.09	44.4	41.18	28.9
20.8	18.39	2.4	57.35	49.0	13.32	23.8	7.54	42.5	42.15	27.4
30.7	20.49	3.5	57.77	47.7	13.65	25.7	8.00	41.2	43.15	26.5
Feb. 9.7	22.53	5.2	58.18	47.0	13.97	27.5	8.44	40.5	44.15	26.3
	1.91	2.1	38	0.0	30	1.7	43	0.0	0.95	0.4
19.7	24.44	7.3	58.56	47.0	14.27	29.2	8.87	40.5	45.10	26.7
Mar. 1.7	26.20	9.9	58.90	47.5	14.54	30.7	9.26	41.1	45.98	27.8
11.6	27.76	12.8	59.21	48.6	14.78	32.0	9.60	42.3	46.77	29.5
21.6	29.11	16.0	59.47	50.2	14.99	33.1	9.89	44.0	47.43	31.7
31.6	30.21	19.4	59.68	52.2	15.17	34.1	10.13	46.1	47.94	34.3
	0.84	3.6	16	2.3	15	0.7	18	2.5	0.36	2.9
Apr. 10.5	31.05	23.0	59.84	54.5	15.32	34.8	10.31	48.6	48.30	37.2
20.5	31.63	26.6	59.94	57.0	15.44	35.3	10.43	51.2	48.50	40.2
30.5	31.92	30.3	60.00	59.6	15.53	35.7	10.49	54.0	48.54	43.3
May 10.5	31.94	33.8	60.01	62.3	15.59	35.9	10.50	56.8	48.43	46.4
20.4	31.68	37.2	59.97	64.8	15.62	35.9	10.46	59.5	48.17	49.2
	0.53	3.2	08	2.3	01	0.0	09	2.5	0.40	2.6
30.4	31.15	40.4	59.89	67.1	15.63	35.9	10.37	62.0	47.77	51.8
June 9.4	30.37	43.2	59.78	69.2	15.61	35.7	10.23	64.2	47.26	54.1
19.4	29.35	45.7	59.64	71.0	15.56	35.5	10.06	66.1	46.64	55.9
29.3	28.12	47.8	59.47	72.4	15.50	35.3	9.86	67.6	45.94	57.3
July 9.3	26.72	49.4	59.27	73.4	15.41	34.9	9.63	68.6	45.17	58.2
	1.53	1.1	21	0.6	10	0.4	25	0.6	0.82	0.3
19.3	25.19	50.5	59.06	74.0	15.31	34.5	9.38	69.2	44.35	58.5
29.3	23.57	51.0	58.84	74.1	15.20	34.0	9.11	69.3	43.51	58.3
Aug. 8.2	21.91	50.9	58.62	73.8	15.07	33.5	8.84	69.0	42.67	57.6
18.2	20.28	50.3	58.39	73.0	14.94	33.0	8.57	68.1	41.83	56.4
28.2	18.73	49.2	58.18	71.8	14.82	32.5	8.31	66.8	41.03	54.6
	1.41	1.7	20	1.7	11	0.4	25	1.7	0.75	2.2
Sept 7.1	17.32	47.5	57.98	70.1	14.71	32.1	8.06	65.1	40.28	52.4
17.1	16.11	45.4	57.81	68.0	14.61	31.7	7.85	62.9	39.61	49.8
27.1	15.16	42.9	57.67	65.6	14.54	31.4	7.67	60.3	39.03	46.7
Oct. 7.1	14.51	40.2	57.57	62.8	14.51	31.3	7.54	57.4	38.56	43.4
17.0	14.19	37.3	57.53	59.7	14.51	31.3	7.46	54.1	38.22	39.8
	0.05	3.0	01	3.3	06	0.2	02	3.5	0.20	3.9
27.0	14.24	34.3	57.54	56.4	14.57	31.5	7.44	50.6	38.02	35.9
Nov. 6.0	14.65	31.4	57.61	52.9	14.67	32.0	7.49	47.0	37.97	32.0
16.0	15.43	28.6	57.74	49.3	14.82	32.8	7.62	43.2	38.09	28.1
25.9	16.54	26.2	57.94	45.7	15.02	33.8	7.81	39.5	38.37	24.2
Dec. 5.9	17.97	24.2	58.20	42.2	15.26	35.0	8.07	35.8	38.81	20.5
	1.68	1.6	31	3.3	28	1.5	32	3.4	0.59	3.4
15.9	19.65	22.6	58.51	38.9	15.54	36.5	8.39	32.4	39.40	17.1
25.8	21.54	21.6	58.87	35.8	15.86	38.1	8.76	29.3	40.13	14.1
35.8	23.58	21.2	59.26	33.2	16.19	39.9	9.17	26.6	40.97	11.6

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ρ Bootis.			α Centauri.			33 Bootis.			α Apodis.			ε Bootis.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h m	s	°	h m	s	°	h m	s	°	h m	s	°	h m	s	°
	14 27		+30 45	14 33		-60 27	14 35		+44 47	14 36		-78 39	14 41		+27 26
Jan. 0.8	55.70		50.3	25.67		34.4	27.89		22.1	31.48		29.0	1.91		64.6
10.8	56.04	.34	47.8	26.23	.56	34.7	28.27	.38	19.5	32.75	1.27	28.7	2.24	.33	62.1
20.8	56.40	.36	45.7	26.80	.57	35.4	28.67	.40	17.4	34.07	1.32	29.0	2.58	.34	59.9
30.8	56.75	.35	44.0	27.37	.56	36.6	29.08	.41	15.9	35.39	1.32	29.8	2.93	.35	58.1
Feb. 9.7	57.10	.33	42.9	27.93	.53	38.2	29.48	.38	14.9	36.69	1.30	31.2	3.27	.34	56.8
19.7	57.43		42.3	28.46		40.2	29.86		14.6	37.93		33.0	3.60		56.1
Mar. 1.7	57.73	.30	42.2	28.94	.48	42.5	30.21	.35	14.9	39.10	1.17	35.3	3.90	.30	55.8
11.6	58.00	.27	42.7	29.38	.44	45.0	30.53	.32	15.8	40.16	1.06	37.9	4.17	.27	56.1
21.6	58.23	.43	43.6	29.77	.39	47.7	30.80	.27	17.2	41.10	.94	40.8	4.41	.24	56.8
31.6	58.43	.20	44.9	30.11	.34	50.5	31.03	.23	19.0	41.90	.80	44.0	4.62	.21	57.9
Apr. 10.6	58.59	.16	46.5	30.39	.28	53.4	31.21	.18	21.2	42.56	.66	47.4	4.79	.17	59.3
20.5	58.71	.12	48.4	30.61	.22	56.3	31.35	.14	23.6	43.06	.50	50.8	4.92	.13	61.1
30.5	58.79	.08	50.4	30.76	.15	59.1	31.43	.08	26.2	43.40	.34	54.3	5.02	.10	63.0
May 10.5	58.84	.05	52.6	30.86	.10	61.9	31.47	.04	28.8	43.58	.18	57.7	5.08	.06	65.0
20.5	58.85	.01	54.7	30.89	.03	64.5	31.47	.00	31.4	43.59	.01	61.0	5.11	.03	67.0
30.4	58.83	.02	56.7	30.87	.02	66.9	31.42	.05	33.8	43.59	.16	64.1	5.11	.00	69.0
June 9.4	58.78	.05	58.6	30.78	.09	69.0	31.34	.08	36.1	43.43	.31	67.0	5.11	.03	70.8
19.4	58.71	.07	60.3	30.64	.14	70.9	31.22	.12	38.0	43.12	.47	69.5	5.08	.06	72.5
29.3	58.61	.10	61.7	30.44	.20	72.4	31.07	.15	39.6	42.65	.60	71.7	5.02	.09	74.0
July 9.3	58.48	.13	62.8	30.20	.24	73.6	30.90	.17	40.9	42.05	.73	73.4	4.93	.11	75.2
19.3	58.34	.14	63.6	29.92	.28	74.3	30.70	.20	41.7	41.32	.82	74.4	4.82	.13	76.2
29.3	58.19	.15	64.0	29.60	.32	74.6	30.48	.22	42.1	40.50	.90	75.4	4.69	.15	76.1
Aug. 8.2	58.02	.17	64.1	29.35	.35	74.4	30.26	.22	42.1	39.60	.90	75.4	4.54	.16	76.6
18.2	57.85	.17	63.8	29.26	.34	73.9	30.26	.23	42.0	38.65	.95	75.6	4.38	.16	76.8
28.2	57.69	.16	63.1	28.91	.34	72.9	30.03	.22	41.5	37.70	.93	75.3	4.22	.16	76.7
38.2	57.69	.16	63.1	28.57	.31	72.9	29.81	.21	40.5	36.77	.87	74.4	4.06	.16	76.2
Sept. 7.2	57.53		62.1	28.26		71.5	29.60		39.1	40.50		74.7	4.69		76.1
17.1	57.40	.13	60.7	27.98	.28	69.7	29.41	.19	37.3	39.60	.90	75.4	4.54	.15	76.6
27.1	57.29	.11	59.0	27.76	.22	67.7	29.25	.16	35.0	38.65	.95	75.6	4.38	.16	76.8
Oct. 7.1	57.21	.08	56.9	27.60	.16	65.5	29.13	.12	32.4	37.70	.93	75.3	4.22	.16	76.7
17.0	57.17	.04	54.5	27.52	.08	63.2	29.05	.08	29.5	36.77	.87	74.4	4.06	.16	76.2
27.0	57.18	.01	51.8	27.53	.01	60.9	29.03	.02	26.3	40.50	.90	74.7	4.69	.15	76.1
Nov. 6.0	57.25	.07	48.9	27.64	.11	58.7	29.07	.04	22.9	39.60	.90	75.4	4.54	.15	76.6
16.0	57.37	.12	45.9	27.84	.20	56.7	29.17	.10	19.4	38.65	.95	75.6	4.38	.16	76.8
25.9	57.54	.17	42.7	28.13	.29	54.9	29.34	.17	15.8	37.70	.93	75.3	4.22	.16	76.7
Dec. 5.9	57.76	.22	39.6	28.50	.37	53.5	29.56	.22	12.2	36.77	.87	74.4	4.06	.16	76.2
15.9	58.02	.26	36.5	28.95	.45	52.5	29.84	.28	8.8	40.50	.90	74.7	4.69	.15	76.1
25.9	58.33	.31	33.5	29.45	.50	52.0	30.17	.33	5.6	39.60	.90	75.4	4.54	.15	76.6
35.8	58.66	.33	30.8	30.00	.55	52.0	30.54	.37	2.8	38.65	.95	75.6	4.38	.16	76.8

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Libræ.			$\beta$ Ursæ Minoris.			$\beta$ Bootis.			$\gamma$ Scorpii.			$\delta$ Bootis.		
	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	14	45	—15 40	14	50	+74 30	14	58	+40 44	14	58	—24 55	15	11	+33 38
	s	"	"	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.8	52.02		0.0	55.35		69.2	31.78		32.5	45.99		35.6	50.83		51.8
10.8	52.35	.33	1.7	56.13	.78	66.8	32.13	.35	29.8	46.33	.34	36.8	51.15	.32	49.1
20.8	52.69	.34	3.4	56.97	.89	64.9	32.51	.38	27.5	46.68	.35	38.2	51.49	.34	46.7
30.8	53.03	.34	5.1	57.86	.91	63.7	32.89	.38	25.7	47.04	.36	39.8	51.85	.36	44.8
Feb. 9.7	53.36	.33	6.8	58.77	.88	63.1	33.27	.37	24.5	47.39	.35	41.4	52.20	.35	43.4
		.31	1.6			0.1			0.7		.33	1.6		.35	0.9
19.7	53.67		8.4	59.65		63.2	33.64		23.8	47.72		43.0	52.55		42.5
Mar. 1.7	53.97	.30	9.9	60.48	.83	64.0	33.98	.34	23.8	48.04	.32	44.6	52.88	.33	42.2
11.7	54.23	.26	11.2	61.24	.76	65.4	34.30	.32	24.4	48.33	.29	46.1	53.18	.30	42.5
21.6	54.47	.24	12.3	61.89	.65	67.4	34.58	.28	25.5	48.59	.26	47.6	53.46	.28	43.2
31.6	54.68	.21	13.3	62.43	.54	69.8	34.83	.25	27.0	48.83	.24	48.9	53.70	.24	44.5
		.19	0.8		.40	2.7		.20	2.0		.20	1.2		.20	1.6
Apr. 10.6	54.87		14.1	62.83		72.5	35.03		29.0	49.03		50.1	53.90		46.1
20.5	55.02	.15	14.7	63.10	.27	75.5	35.19	.16	31.2	49.21	.18	51.2	54.07	.17	48.1
30.5	55.14	.09	15.2	63.22	.12	78.6	35.30	.11	32.5	49.35	.14	52.2	54.20	.13	50.3
May 10.5	55.23	.06	15.5	63.20	.02	81.7	35.37	.07	33.7	49.46	.11	53.0	54.29	.09	52.6
20.5	55.29	.04	15.7	63.04	.16	84.7	35.40	.03	36.2	49.54	.08	53.7	54.35	.06	55.0
			0.1		.28	2.7		.01	2.5		.05	0.6		.02	2.3
30.4	55.33		15.8	62.76		87.4	35.39		41.3	49.59		54.3	54.37		57.3
June 9.4	55.34	.01	15.8	62.36	.40	89.9	35.34	.05	43.6	49.61	.02	54.8	54.35	.02	59.5
19.4	55.32	.02	15.7	61.86	.50	92.0	35.26	.08	45.7	49.60	.01	55.2	54.30	.05	61.5
29.4	55.27	.05	15.5	61.27	.59	93.7	35.14	.12	47.5	49.56	.04	55.4	54.21	.09	63.3
July 9.3	55.20	.07	15.3	60.61	.66	94.9	35.00	.14	48.9	49.49	.07	55.5	54.10	.11	64.8
		.10	0.3		.72	0.7		.18	1.1		.10	0.0		.14	1.1
19.3	55.10		15.0	59.89		95.6	34.82		50.0	49.39		55.5	53.96		65.9
29.3	54.99	.11	14.7	59.14	.75	95.8	34.63	.19	50.6	49.27	.12	55.4	53.80	.16	66.7
Aug. 8.2	54.86	.13	14.3	58.37	.77	95.4	34.42	.21	50.8	49.13	.14	55.1	53.62	.18	67.2
18.2	54.72	.14	13.8	57.59	.78	94.5	34.21	.21	50.6	48.98	.15	54.7	53.43	.19	67.2
28.2	54.58	.14	13.3	56.83	.76	93.2	33.99	.22	50.0	48.83	.15	54.1	53.23	.20	66.8
		.13	0.4		.72	1.9		.21	1.1		.15	0.6		.19	0.8
Sept. 7.2	54.45		12.9	56.11		91.3	33.78		48.9	48.68		53.5	53.04		66.0
17.1	54.33	.12	12.5	55.45	.66	88.9	33.59	.19	47.4	48.54	.14	52.8	52.86	.18	64.8
27.1	54.24	.09	12.1	54.85	.60	86.1	33.42	.17	45.5	48.43	.11	52.1	52.71	.15	63.2
Oct. 7.1	54.17	.07	11.9	54.35	.50	83.0	33.28	.14	43.2	48.35	.08	51.4	52.58	.13	61.3
17.1	54.15	.02	11.7	53.96	.39	79.6	33.19	.09	40.6	48.31	.04	50.8	52.49	.09	59.0
		.02	0.1		.26	3.7		.04	3.0		.01	0.5		.05	2.6
27.0	54.17		11.8	53.70		75.9	33.15		37.6	48.32		50.3	52.44		56.4
Nov. 6.0	54.24	.07	12.0	53.57	.13	72.0	33.16	.01	34.4	48.38	.06	50.0	52.45	.01	53.5
16.0	54.36	.12	12.5	53.59	.02	68.1	33.23	.07	31.0	48.50	.12	49.9	52.51	.06	50.4
25.9	54.54	.18	13.3	53.76	.17	64.2	33.36	.13	27.5	48.67	.17	50.0	52.63	.12	47.2
Dec. 5.9	54.76	.22	14.2	54.08	.32	60.4	33.55	.19	24.0	48.89	.22	50.4	52.80	.17	43.9
		.26	1.2		.47	3.6		.25	3.4		.27	0.6		.22	3.3
15.9	55.02		15.4	54.55		56.8	33.80		20.6	49.16		51.0	53.02		40.6
25.9	55.32	.30	16.8	55.15	.60	53.6	34.09	.29	17.4	49.46	.30	51.9	53.29	.27	37.4
35.8	55.64	.32	18.4	55.86	.71	50.8	34.43	.34	14.4	49.79	.33	53.0	53.60	.31	34.5

# FIXED STARS, 1910.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Libræ.			$\gamma^2$ Ursæ Minoris.			$\mu^4$ Bootis.			$\rho$ Octantis.			$\beta$ Coronæ Borealis.		
	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h m	s	°	h m	s	°	h m	s	°	h m	s	°	h m	s	°
	15 12		9 3	15 20		+72 8	15 21		+37 41	15 22		-84 9	15 24		+29 24
Jan. 0.9	7.87		2.2	49.45		61.3	3.73		23.2	9.27		45.9	5.40		48.2
10.8	8.18	.31	1.7	50.08	.63	58.5	4.06	.33	20.4	11.50	2.23	1.2	5.71	.31	45.4
20.8	8.50	.32	1.8	50.78	.70	56.3	4.41	.35	18.0	13.91	2.41	0.5	6.04	.33	43.0
30.8	8.83	.33	1.7	51.54	.76	54.6	4.77	.36	16.0	16.41	2.50	0.0	6.38	.34	41.0
Feb. 9.8	9.16	.33	1.6	52.33	.79	53.6	5.13	.36	14.5	18.95	2.54	0.5	6.72	.34	39.5
		.31	1.4		.78	0.3		.36	0.8		2.51	1.1		.34	1.0
19.7	9.47		10.4	53.11		53.3	5.49		13.7	21.46		45.8	7.06		38.5
Mar. 1.7	9.77	.30	1.2	53.87	.76	53.7	5.84	.35	13.4	23.89	2.43	1.5	7.38	.32	38.0
11.7	10.04	.27	1.0	54.58	.71	54.7	6.16	.32	13.7	26.18	2.29	2.0	7.68	.30	38.1
21.6	10.29	.25	0.8	55.21	.63	56.3	6.45	.29	14.6	28.29	2.11	2.4	7.95	.27	38.7
31.6	10.52	.23	0.6	55.75	.54	58.4	6.70	.25	15.9	30.19	1.90	2.7	8.20	.25	39.7
		.20	0.3		.44	2.6		.22	1.8		1.64	3.0		.21	1.5
Apr. 10.6	10.72		14.3	56.19		61.0	6.92		17.7	31.83		57.4	8.41		41.2
20.6	10.89	.17	0.2	56.51	.32	63.8	7.10	.18	19.8	33.19	1.36	3.2	8.59	.18	42.0
30.5	11.04	.15	0.0	56.71	.20	66.9	7.24	.14	22.1	34.25	1.06	3.4	8.73	.14	44.9
May 10.5	11.16	.12	0.1	56.79	.08	70.0	7.34	.10	24.6	34.99	0.74	3.4	8.83	.10	47.1
20.5	11.24	.08	0.3	56.75	.04	73.1	7.40	.06	27.1	35.40	0.41	3.5	8.90	.07	49.4
		.06	0.3		.16	3.0		.02	2.5		0.06	3.3		.04	2.2
30.5	11.30		13.8	56.59		76.1	7.42		29.6	35.46		74.2	8.94		51.6
June 9.4	11.32	.02	0.4	56.33	.26	78.8	7.40	.02	32.0	35.19	0.27	3.2	8.94	.00	53.7
19.4	11.32	.00	0.4	55.97	.36	81.2	7.35	.05	34.2	34.58	0.61	3.0	8.90	.04	55.7
29.4	11.29	.03	0.4	55.52	.45	83.3	7.26	.09	36.1	33.66	0.92	2.7	8.84	.06	57.5
July 9.3	11.23	.06	0.4	54.99	.53	84.9	7.13	.13	37.7	32.46	1.20	2.3	8.74	.10	59.1
		.08	0.5		.59	1.1		.15	1.3		1.46	1.9		.12	1.2
19.3	11.15		11.7	54.40		86.0	6.98		39.0	31.00		87.3	8.62		60.3
29.3	11.05	.10	0.4	53.76	.64	86.7	6.80	.18	39.9	29.33	1.67	1.4	8.47	.15	61.2
Aug. 8.3	10.93	.12	0.4	53.09	.67	86.8	6.61	.19	40.4	27.52	1.81	0.9	8.31	.16	61.7
18.2	10.79	.14	0.3	52.40	.69	86.4	6.40	.21	40.5	25.61	1.91	0.3	8.13	.18	61.9
28.2	10.65	.14	0.3	51.71	.69	85.5	6.19	.21	40.1	23.68	1.93	0.2	7.94	.19	61.7
		.14	0.2		.67	1.5		.21	0.8		1.88	0.8		.18	0.6
Sept. 7.2	10.51		10.1	51.04		84.0	5.98		39.3	21.80		88.9	7.76		61.1
17.2	10.38	.13	0.2	50.41	.63	82.1	5.78	.20	38.1	20.06	1.74	1.4	7.58	.18	60.1
27.1	10.27	.11	0.1	49.82	.59	79.7	5.60	.18	36.5	18.52	1.54	1.8	7.42	.16	58.8
Oct. 7.1	10.18	.09	0.1	49.31	.51	76.9	5.45	.15	34.4	17.24	1.28	2.3	7.29	.13	57.1
17.1	10.13	.05	0.2	48.89	.42	73.7	5.34	.11	32.0	16.30	0.94	2.6	7.20	.09	55.0
		.00	0.5		.32	3.5		.07	2.7		0.56	2.8		.05	2.4
27.0	10.13		10.6	48.57		70.2	5.27		29.3	15.74		78.0	7.15		52.6
Nov. 6.0	10.17	.04	0.6	48.36	.21	66.5	5.26	.01	26.3	15.59	0.15	3.0	7.15	.00	50.0
16.0	10.26	.09	0.8	48.29	.07	62.7	5.30	.04	23.1	15.87	0.28	3.0	7.20	.05	47.1
26.0	10.40	.14	1.1	48.35	.06	58.8	5.40	.10	19.7	16.58	0.71	2.9	7.30	.10	44.1
Dec. 5.9	10.59	.19	1.2	48.54	.19	54.9	5.56	.16	16.3	17.71	1.13	2.6	7.46	.16	40.9
		.21	1.4		.33	3.7		.22	3.4		1.51	2.3		.21	3.1
15.9	10.83		15.7	48.87		51.2	5.78		12.9	19.22		64.2	7.67		37.8
25.9	11.10	.27	1.6	49.32	.45	47.7	6.04	.26	9.7	21.06	1.84	1.9	7.92	.25	34.7
35.9	11.40	.30	1.7	49.89	.57	44.6	6.35	.31	6.6	23.17	2.11	1.5	8.21	.29	31.8

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Coronæ Borealis.			$\alpha$ Serpentis.			$\epsilon$ Serpentis.			$\zeta$ Ursæ Minoris.			$\epsilon$ Coronæ Borealis.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.	
	h m 15 30	° +27	° 0	h m 15 39	° +6	° 42	h m 15 46	° +4	° 44	h m 15 47	° +78	° 3	h m 15 53	° +27	° 7
	s "	"	"	s "	"	"	s "	"	"	s "	"	"	s "	"	"
Jan. 0.9	50.88		54.4	48.18		27.3	17.82		51.5	11.54		65.0	49.79		69.6
10.9	51.18	.30	54.6	48.47	.29	25.1	18.11	.29	49.4	12.31	.77	62.0	50.07	.28	66.8
20.8	51.50	.32	54.8	48.77	.30	23.0	18.41	.30	47.4	13.22	.91	59.5	50.38	.31	64.3
30.8	51.83	.33	55.0	49.09	.32	21.2	18.72	.31	45.5	14.24	1.02	57.7	50.71	.33	62.1
Feb. 9.8	52.17	.34	55.6	49.41	.32	19.6	19.04	.32	43.9	15.33	1.09	56.4	51.04	.33	60.4
		.33	55.1		.31	1.3		.31	1.2		1.11				1.2
19.7	52.50	.32	44.5	49.72	.30	18.3	19.35	.30	42.7	16.44	1.11	55.8	51.37	.32	59.2
Mar. 1.7	52.82	.30	44.0	50.02	.28	17.4	19.65	.29	41.7	17.55	1.05	55.9	51.69	.31	58.5
11.7	53.12	.28	43.9	50.30	.27	16.8	19.94	.26	41.1	18.60	.97	56.7	52.00	.29	58.4
21.7	53.40	.24	44.4	50.57	.24	16.6	20.20	.25	40.8	19.57	.84	58.0	52.29	.26	58.7
31.6	53.64	.22	45.3	50.81	.21	16.7	20.45	.22	40.9	20.41	.71	59.9	52.55	.23	59.6
Apr. 10.6	53.86	.18	46.7	51.02	.19	17.2	20.67	.19	41.3	21.12	.54	62.3	52.78	.21	60.9
20.6	54.04	.15	48.3	51.21	.16	17.9	20.86	.17	41.9	21.66	.37	65.1	52.99	.17	62.5
30.6	54.19	.11	50.2	51.37	.13	18.9	21.03	.14	42.8	22.03	.18	68.0	53.16	.14	64.4
May 10.5	54.30	.08	52.3	51.50	.11	20.0	21.17	.11	43.8	22.21	.00	71.1	53.30	.10	66.5
20.5	54.38	.05	54.5	51.61	.07	21.2	21.28	.08	44.9	22.21	.18	74.2	53.40	.06	68.7
			54.1			1.2			1.2						2.2
30.5	54.43	.01	56.6	51.68	.04	22.4	21.36	.05	46.1	22.03	.36	77.3	53.46	.03	70.9
June 9.4	54.44	.02	58.7	51.72	.02	23.7	21.41	.02	47.2	21.67	.51	80.2	53.49	.00	73.1
19.4	54.42	.06	60.7	51.74	.02	24.9	21.43	.02	48.4	21.16	.66	82.8	53.49	.04	75.2
29.4	54.36	.08	62.5	51.72	.05	26.0	21.41	.04	49.4	20.50	.79	85.0	53.45	.07	77.1
July 9.4	54.28	.11	64.0	51.67	.08	27.0	21.37	.07	50.4	19.71	.89	86.9	53.38	.10	78.8
			1.2			0.9			0.9						1.4
19.3	54.17	.14	65.2	51.59	.10	27.9	21.30	.10	51.3	18.82	.98	88.3	53.28	.13	80.2
29.3	54.03	.16	66.1	51.49	.12	28.6	21.20	.12	52.0	17.84	1.04	89.3	53.15	.16	81.3
Aug. 8.3	53.87	.18	66.7	51.37	.14	29.2	21.08	.14	52.5	16.80	1.08	89.7	52.99	.17	82.1
18.3	53.69	.18	67.0	51.23	.15	29.6	20.94	.15	52.9	15.72	1.09	89.6	52.82	.19	82.5
28.2	53.51	.18	66.9	51.08	.15	29.7	20.79	.15	53.1	14.63	1.09	88.9	52.63	.19	82.6
			0.5			0.0			0.0						0.3
Sept. 7.2	53.33	.17	66.4	50.93	.15	29.7	20.64	.15	53.1	13.54	1.04	87.8	52.44	.19	82.3
17.2	53.16	.16	65.5	50.78	.13	29.4	20.49	.13	52.9	12.50	.99	86.2	52.25	.17	81.6
27.1	53.00	.13	64.3	50.65	.11	28.9	20.36	.12	52.5	11.51	.89	84.1	52.08	.15	80.5
Oct. 7.1	52.87	.09	62.7	50.54	.08	28.2	20.24	.08	51.9	10.62	.77	81.6	51.93	.11	79.1
17.1	52.78	.06	60.8	50.46	.04	27.2	20.16	.04	51.0	9.85	.64	78.7	51.82	.08	77.3
			2.3			1.2			1.1						2.1
27.1	52.72	.00	58.5	50.42	.01	26.0	20.12	.00	49.9	9.21	.48	75.4	51.74	.03	75.2
Nov. 6.0	52.72	.04	56.0	50.43	.05	24.5	20.12	.05	48.5	8.73	.29	71.8	51.71	.02	72.8
16.0	52.76	.10	53.2	50.48	.11	22.8	20.17	.10	46.9	8.44	.11	68.1	51.73	.07	70.1
26.0	52.86	.16	50.3	50.59	.15	20.9	20.27	.15	45.2	8.33	.10	64.3	51.80	.12	67.2
Dec. 6.0	53.02	.20	47.3	50.74	.20	18.8	20.42	.19	43.3	8.43	.30	60.4	51.92	.18	64.2
			3.1			2.2			2.1						3.1
15.9	53.22	.25	44.2	50.94	.24	16.6	20.61	.24	41.2	8.73	.49	56.7	52.10	.22	61.1
25.9	53.47	.28	41.2	51.18	.27	14.4	20.85	.27	39.0	9.22	.67	53.2	52.32	.27	58.0
35.9	53.75		38.3	51.45		12.2	21.12		36.9	9.89		50.0	52.59		55.1

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Scorpii.		$\beta^1$ Scorpii.		$\phi$ Herculis.		Groombridge 2320.		$\delta^1$ Apodis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 15 54	° ' " -22 21	h m 16 0	° ' " -19 33	h m 16 5	° ' " +45 9	h m 16 6	° ' " +68 2	h m 16 6	° ' " -78 27
Jan. 0.9	58.31	54.3	9.86	31.8	54.05	63.8	1.75	37.3	43.24	61.9
10.9	58.62	55.2	10.16	32.9	54.35	60.7	2.20	34.1	44.33	60.4
20.8	58.95	56.3	10.48	34.0	54.69	57.9	2.72	31.3	45.53	59.4
30.8	59.29	57.5	10.81	35.2	55.06	55.5	3.30	29.1	46.82	58.8
Feb. 9.8	59.63	58.7	11.15	36.5	55.44	53.8	3.93	27.5	48.16	58.7
19.8	59.97	59.9	11.48	37.7	55.83	52.6	4.58	26.5	49.51	59.1
Mar. 1.7	60.30	61.1	11.81	38.8	56.21	52.0	5.22	26.2	50.85	60.0
11.7	60.62	62.2	12.12	39.8	56.58	52.1	5.85	26.6	52.15	61.4
21.7	60.92	63.2	12.41	40.7	56.92	52.8	6.43	27.7	53.39	63.1
31.6	61.19	64.2	12.69	41.5	57.24	54.1	6.95	29.3	54.54	65.2
Apr. 10.6	61.44	65.0	12.94	42.2	57.52	55.9	7.41	31.5	55.59	67.6
20.6	61.67	65.7	13.16	42.7	57.76	58.0	7.79	34.0	56.51	70.3
30.6	61.87	66.3	13.36	43.1	57.96	60.5	8.07	36.9	57.29	73.2
May 10.5	62.04	66.8	13.53	43.5	58.11	63.2	8.26	40.0	57.93	76.2
20.5	62.18	67.2	13.68	43.7	58.21	66.1	8.35	43.2	58.41	79.4
30.5	62.28	67.6	13.79	43.9	58.27	69.0	8.34	46.3	58.71	82.5
June 9.5	62.36	67.9	13.87	44.0	58.28	71.8	8.24	49.4	58.84	85.6
19.4	62.40	68.1	13.91	44.1	58.25	74.4	8.05	52.2	58.79	88.5
29.4	62.40	68.3	13.92	44.2	58.17	76.8	7.77	54.7	58.56	91.3
July 9.4	62.37	68.5	13.89	44.2	58.04	78.9	7.42	56.9	58.17	93.8
19.3	62.30	68.5	13.83	44.1	57.88	80.7	7.00	58.7	57.62	95.9
29.3	62.21	68.5	13.74	44.1	57.68	82.0	6.52	60.0	56.94	97.7
Aug. 8.3	62.08	68.4	13.62	43.9	57.46	83.0	5.99	60.8	56.14	99.0
18.3	61.94	68.2	13.48	43.7	57.21	83.5	5.43	61.1	55.25	99.8
28.2	61.78	68.0	13.32	43.5	56.94	83.5	4.85	60.9	54.31	100.1
Sept. 7.2	61.62	67.7	13.16	43.2	56.67	83.0	4.27	60.2	53.36	99.9
17.2	61.46	67.3	13.01	42.9	56.41	82.1	3.70	59.0	52.44	99.1
27.2	61.32	66.9	12.86	42.6	56.16	80.7	3.16	57.2	51.58	97.8
Oct. 7.1	61.20	66.5	12.74	42.3	55.94	78.9	2.67	55.0	50.82	96.0
17.1	61.11	66.1	12.65	42.0	55.75	76.6	2.23	52.4	50.21	93.8
27.1	61.06	65.7	12.60	41.9	55.60	74.0	1.87	49.3	49.78	91.3
Nov. 6.0	61.07	65.5	12.60	41.8	55.51	71.0	1.60	46.0	49.54	88.6
16.0	61.13	65.4	12.65	41.9	55.48	67.8	1.43	42.3	49.53	85.8
26.0	61.24	65.5	12.76	42.2	55.51	64.3	1.37	38.5	49.74	82.9
Dec. 6.0	61.40	65.8	12.91	42.6	55.61	60.7	1.43	34.6	50.17	80.2
15.9	61.61	66.3	13.12	43.3	55.77	57.1	1.60	30.8	50.81	77.7
25.9	61.87	67.0	13.36	44.1	55.99	53.5	1.88	27.1	51.65	75.5
35.9	62.16	67.9	13.65	45.1	56.26	50.2	2.27	23.7	52.66	73.7

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\delta$ Ophiuchi.		$\sigma$ Coronæ Borealis.		$\tau$ Herculis.		$\gamma$ Apodis.		$\eta$ Ursæ Minoris.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 16 9	° ' " - 3 27	h m 16 11	° ' " + 34 4	h m 16 17	° ' " + 46 31	h m 16 19	° ' " - 78 41	h m 16 20	° ' " + 75 57
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 0.9	35.63	48.2	16.54	62.7	0.08	28.2	28.03	37.0	3.57	35.0
10.9	35.90	50.0	16.81	59.7	0.37	25.0	29.10	35.3	4.13	31.8
20.9	36.19	51.7	17.12	57.0	0.70	22.1	30.30	34.1	4.83	29.0
30.8	36.50	53.3	17.45	54.7	1.07	19.7	31.59	33.3	5.64	26.7
Feb. 9.8	36.82	54.7	17.79	52.9	1.45	17.8	32.94	33.0	6.53	25.0
19.8	37.13	56.0	18.13	51.6	1.84	16.6	34.32	33.2	7.47	24.0
Mar. 1.7	37.44	57.0	18.47	50.9	2.23	15.9	35.70	33.9	8.42	23.6
11.7	37.73	57.7	18.80	50.7	2.60	15.9	37.04	35.1	9.35	23.9
21.7	38.01	58.2	19.10	51.1	2.96	16.5	38.33	36.6	10.23	24.9
31.7	38.27	58.4	19.39	52.1	3.29	17.7	39.54	38.5	11.03	26.5
Apr. 10.6	38.51	58.3	19.65	53.5	3.59	19.5	40.65	40.8	11.73	28.5
20.6	38.73	58.1	19.87	55.3	3.85	21.6	41.64	43.3	12.30	31.0
30.6	38.92	57.6	20.06	57.5	4.06	24.1	42.50	46.1	12.74	33.9
May 10.5	39.09	57.0	20.22	59.9	4.23	26.9	43.21	49.0	13.02	36.9
20.5	39.23	56.3	20.33	62.4	4.35	29.8	43.75	52.1	13.15	40.1
30.5	39.33	55.5	20.41	64.9	4.42	32.7	44.12	55.2	13.13	43.3
June 9.5	39.41	54.7	20.45	67.4	4.44	35.6	44.31	58.3	12.95	46.4
19.4	39.46	53.9	20.45	69.8	4.41	38.3	44.32	61.3	12.63	49.2
29.4	39.47	53.1	20.41	72.0	4.33	40.8	44.15	64.1	12.18	51.8
July 9.4	39.44	52.4	20.33	74.0	4.21	43.0	43.80	66.7	11.60	54.1
19.4	39.39	51.8	20.22	75.7	4.05	44.9	43.29	69.0	10.91	56.0
29.3	39.30	51.3	20.07	77.0	3.85	46.4	42.62	70.9	10.13	57.4
Aug. 8.3	39.19	50.8	19.90	78.0	3.62	47.5	41.83	72.3	9.27	58.4
18.3	39.06	50.4	19.70	78.5	3.36	48.1	40.95	73.3	8.36	58.8
28.3	38.91	50.2	19.49	78.7	3.09	48.2	40.00	73.7	7.42	58.7
Sept. 7.2	38.76	50.1	19.27	78.4	2.81	47.9	39.03	73.6	6.47	58.1
17.2	38.61	50.1	19.06	77.8	2.53	47.1	38.07	73.0	5.53	57.0
27.2	38.46	50.2	18.85	76.7	2.26	45.8	37.16	71.8	4.63	55.4
Oct. 7.1	38.34	50.5	18.67	75.2	2.02	44.1	36.36	70.2	3.79	53.4
17.1	38.24	51.0	18.52	73.3	1.81	41.9	35.69	68.1	3.03	50.8
27.1	38.18	51.6	18.41	71.0	1.64	39.3	35.20	65.7	2.38	47.9
Nov. 6.1	38.17	52.5	18.34	68.4	1.53	36.4	34.90	63.1	1.86	44.7
16.0	38.20	53.5	18.33	65.5	1.48	33.1	34.82	60.3	1.48	41.1
26.0	38.28	54.8	18.37	62.4	1.49	29.6	34.97	57.4	1.27	37.4
Dec. 6.0	38.42	56.2	18.47	59.2	1.57	26.0	35.35	54.6	1.23	33.6
15.9	38.60	57.7	18.63	55.9	1.71	22.4	35.96	52.0	1.36	29.8
25.9	38.82	59.4	18.83	52.6	1.92	18.8	36.76	49.7	1.66	26.2
35.9	39.07	61.1	19.08	49.5	2.18	15.4	37.74	47.8	2.13	22.7



# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Draconis.		$\alpha$ Scorpii. (Antares.)		$\beta$ Herculis.		$\Lambda$ Draconis.		$\zeta$ Ophiuchi.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 16 22	° +61 42	h m 16 23	° -26 13	h m 16 26	° +21 40	h m 16 28	° +68 57	h m 16 32	° -10 23
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 0.9	43.78 s	52.5 "	50.79 s	55.5 "	19.02 s	60.2 "	6.30 s	34.9 "	9.91 s	7.8 "
10.9	44.13 .35	49.2 3.3	51.09 .30	56.1 0.6	19.27 .25	57.5 2.7	6.70 .40	31.5 3.4	10.17 .26	9.2 1.4
20.9	44.54 .41	46.3 2.9	51.41 .32	56.8 0.7	19.55 .28	55.1 2.4	6.70 .50	31.5 3.0	10.17 .29	9.2 1.3
30.8	45.01 .47	43.8 2.5	51.75 .34	57.6 0.8	19.85 .30	52.9 2.2	7.20 .57	28.5 2.4	10.46 .30	10.5 1.3
Feb. 9.8	45.51 .50	41.9 1.9	52.10 .35	58.5 0.9	20.17 .32	51.1 1.8	7.77 .62	26.1 1.9	10.76 .31	11.8 1.3
	45.51 .52	41.9 1.2	52.10 .35	58.5 1.0	20.17 .31	51.1 1.4	8.39 .66	24.2 1.2	11.07 .32	13.1 1.1
19.8	46.03 .53	40.7 0.5	52.45 .34	59.5 0.9	20.48 .32	49.7 0.9	9.05 .67	23.0 0.5	11.39 .32	14.2 0.9
Mar. 1.8	46.56 .51	40.2 0.1	52.79 .33	60.4 1.0	20.80 .31	48.8 0.4	9.72 .65	22.5 0.1	11.71 .31	15.1 0.8
11.7	47.07 .48	40.3 0.8	53.12 .32	61.4 0.9	21.11 .29	48.4 0.1	10.37 .62	22.6 0.8	12.02 .29	15.9 0.5
21.7	47.55 .45	41.1 1.4	53.44 .31	62.3 0.8	21.40 .27	48.5 0.5	10.99 .58	23.4 1.4	12.31 .28	16.4 0.4
31.7	48.00 .40	42.5 1.9	53.75 .28	63.1 0.8	21.67 .25	49.0 1.0	11.57 .51	24.8 2.0	12.59 .26	16.8 0.1
Apr. 10.6	48.40 .34	44.4 2.4	54.03 .26	63.9 0.7	21.92 .23	50.0 1.4	12.08 .43	26.8 2.4	12.85 .24	16.9 0.0
20.6	48.74 .27	46.8 2.8	54.29 .23	64.6 0.7	22.15 .20	51.4 1.6	12.51 .34	29.2 2.8	13.09 .22	16.9 0.2
30.6	49.01 .20	49.6 3.0	54.52 .21	65.3 0.6	22.35 .17	53.0 1.9	12.85 .24	32.0 3.0	13.31 .19	16.7 0.3
May 10.6	49.21 .13	52.6 3.1	54.73 .17	65.9 0.5	22.52 .14	54.9 2.1	13.09 .15	35.0 3.2	13.50 .16	16.4 0.4
20.5	49.34 .05	55.7 3.2	54.90 .14	66.4 0.5	22.66 .10	57.0 2.1	13.24 .04	38.2 3.2	13.66 .14	16.0 0.5
30.5	49.39 .02	58.9 3.1	55.04 .10	66.9 0.5	22.76 .07	59.1 2.1	13.28 .06	41.4 3.1	13.80 .10	15.5 0.4
June 9.5	49.37 .10	62.0 2.9	55.14 .07	67.4 0.5	22.83 .04	61.2 2.0	13.22 .16	44.5 3.0	13.90 .07	15.1 0.5
19.5	49.27 .17	64.9 2.7	55.21 .03	67.9 0.4	22.87 .01	63.2 1.9	13.06 .25	47.5 2.7	13.97 .03	14.6 0.5
29.4	49.10 .23	67.6 2.4	55.24 .01	68.3 0.3	22.86 .04	65.1 1.8	12.81 .34	50.2 2.4	14.00 .00	14.1 0.4
July 9.4	48.87 .29	70.0 2.0	55.23 .04	68.6 0.3	22.82 .07	66.9 1.5	12.47 .41	52.6 2.1	14.00 .04	13.7 0.4
19.4	48.58 .34	72.0 1.5	55.19 .09	68.9 0.2	22.75 .11	68.4 1.2	12.06 .48	54.7 1.6	13.96 .07	13.3 0.3
29.3	48.24 .38	73.5 1.1	55.10 .11	69.1 0.1	22.64 .13	69.6 1.0	11.58 .54	56.3 1.1	13.89 .10	13.0 0.3
Aug. 8.3	47.86 .42	74.6 0.7	54.99 .15	69.2 0.0	22.51 .16	70.6 0.6	11.04 .59	57.4 0.6	13.79 .13	12.7 0.3
18.3	47.44 .44	75.3 0.1	54.84 .16	69.2 0.1	22.35 .17	71.2 0.4	10.45 .61	58.0 0.1	13.66 .15	12.4 0.2
28.3	47.00 .45	75.4 0.4	54.68 .17	69.1 0.2	22.18 .18	71.6 0.0	9.84 .62	58.1 0.4	13.51 .16	12.2 0.2
Sept. 7.2	46.55 .45	75.0 1.0	54.51 .17	68.9 0.3	22.00 .19	71.6 0.4	9.22 .62	57.7 0.9	13.35 .16	12.0 0.1
17.2	46.10 .43	74.0 1.4	54.34 .17	68.6 0.4	21.81 .18	71.2 0.7	8.60 .59	56.8 1.4	13.19 .15	11.9 0.0
27.2	45.67 .40	72.6 1.9	54.17 .14	68.2 0.5	21.63 .16	70.5 1.0	8.01 .56	55.4 1.9	13.04 .13	11.9 0.0
Oct. 7.2	45.27 .35	70.7 2.4	54.03 .11	67.7 0.5	21.47 .13	69.5 1.4	7.45 .50	53.5 2.4	12.91 .11	11.9 0.2
17.1	44.92 .29	68.3 2.8	53.92 .07	67.2 0.4	21.34 .10	68.1 1.7	6.95 .43	51.1 2.8	12.80 .08	12.1 0.3
27.1	44.63 .23	65.5 3.2	53.85 .02	66.8 0.4	21.24 .05	66.4 2.1	6.52 .34	48.3 3.2	12.72 .03	12.4 0.4
Nov. 6.1	44.40 .14	62.3 3.5	53.83 .03	66.4 0.4	21.19 .01	64.3 2.3	6.18 .24	45.1 3.5	12.69 .02	12.8 0.6
16.0	44.26 .05	58.8 3.7	53.86 .08	66.0 0.2	21.18 .04	62.0 2.5	5.94 .13	41.6 3.7	12.71 .07	13.4 0.8
26.0	44.21 .03	55.1 3.8	53.94 .14	65.8 0.0	21.22 .10	59.5 2.7	5.81 .01	37.9 3.8	12.78 .11	14.2 0.9
Dec. 6.0	44.24 .13	51.3 3.8	54.08 .19	65.8 0.1	21.32 .14	56.8 2.8	5.80 .11	34.1 3.9	12.89 .16	15.1 1.0
16.0	44.37 .22	47.5 3.8	54.27 .23	65.9 0.3	21.46 .19	54.0 2.8	5.91 .22	30.2 3.7	13.05 .21	16.1 1.2
25.9	44.59 .30	43.7 3.5	54.50 .28	66.2 0.5	21.65 .23	51.2 2.8	6.13 .34	26.5 3.5	13.26 .25	17.3 1.3
35.9	44.89	40.2	54.78	66.7	21.88	48.4	6.47	23.0	13.51	18.6

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Triang. Australis.		$\eta$ Herculis.		$\kappa$ Ophiuchi.		$\epsilon$ Ursæ Minoris.		$\delta$ Herculis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 16 39	° 68 51	h m 16 39	° +39 5	h m 16 53	° + 9 30	h m 16 54	° +82 10	h m 16 58	° +33 41
	s	"	s	"	s	"	s	"	s	"
Jan. 0.9	2.14	41.0	46.52	25.9	22.36	47.2	62.65	61.7	14.83	45.2
10.9	2.73	39.4	46.77	22.7	22.59	45.0	63.33	58.3	15.05	42.1
20.9	3.40	38.2	47.06	19.8	22.85	42.9	64.29	55.3	15.32	39.2
30.8	4.13	37.4	47.38	17.3	23.13	41.0	65.49	52.7	15.61	36.7
Feb. 9.8	4.89	37.1	47.72	15.3	23.43	39.3	66.88	50.7	15.93	34.6
19.8	5.67	37.1	48.07	13.8	23.73	38.0	68.40	49.3	16.26	33.0
Mar. 1.8	6.45	37.6	48.43	12.9	24.03	37.0	70.00	48.5	16.59	32.0
11.7	7.23	38.4	48.77	12.6	24.33	36.4	71.62	48.4	16.92	31.5
21.7	7.98	39.6	49.11	12.9	24.62	36.2	73.20	48.9	17.25	31.6
31.7	8.69	41.2	49.42	13.8	24.90	36.4	74.68	50.1	17.55	32.3
Apr. 10.7	9.35	43.0	49.71	15.2	25.17	37.0	76.01	51.8	17.84	33.5
20.6	9.96	45.1	49.97	17.1	25.41	37.9	77.14	54.0	18.11	35.1
30.6	10.50	47.4	50.20	19.3	25.63	39.0	78.04	56.6	18.34	37.1
May 10.6	10.97	49.9	50.39	21.8	25.82	40.4	78.69	59.4	18.55	39.4
20.5	11.36	52.5	50.54	24.4	25.99	41.9	79.07	62.5	18.71	41.9
30.5	11.66	55.2	50.64	27.2	26.13	43.5	79.17	65.6	18.84	44.6
June 9.5	11.86	57.9	50.70	30.0	26.23	45.1	78.98	68.7	18.93	47.3
19.5	11.96	60.5	50.72	32.7	26.30	46.7	78.52	71.7	18.98	49.9
29.5	11.96	63.0	50.69	35.2	26.34	48.3	77.80	74.5	18.08	52.4
July 9.4	11.86	65.3	50.62	37.5	26.34	49.7	76.84	77.1	18.94	54.6
19.4	11.67	67.4	50.51	39.5	26.30	50.9	75.66	79.3	18.86	56.7
29.4	11.39	69.2	50.36	41.1	26.23	52.0	74.29	81.1	18.74	58.4
Aug. 8.3	11.03	70.7	50.18	42.4	26.12	52.9	72.77	82.4	18.59	59.8
18.3	10.60	71.7	49.97	43.3	25.99	53.5	71.12	83.3	18.41	60.8
28.3	10.13	72.2	49.74	43.7	25.84	53.9	69.38	83.8	18.20	61.4
Sept. 7.2	9.63	72.3	49.50	43.7	25.68	54.1	67.59	83.7	17.98	61.6
17.2	9.12	71.9	49.25	43.2	25.51	54.1	65.79	83.1	17.76	61.4
27.2	8.64	71.0	49.01	42.3	25.34	53.8	64.03	82.0	17.53	60.8
Oct. 7.2	8.21	69.7	48.79	41.0	25.18	53.2	62.34	80.4	17.32	59.7
17.1	7.84	68.0	48.60	39.2	25.05	52.3	60.76	78.4	17.14	58.2
27.1	7.56	66.0	48.44	37.0	24.95	51.2	59.34	75.9	16.98	56.3
Nov. 6.1	7.39	63.7	48.33	34.4	24.89	49.9	58.12	73.0	16.87	54.1
16.1	7.34	61.3	48.27	31.5	24.87	48.3	57.13	69.8	16.81	51.5
26.0	7.42	58.8	48.27	28.4	24.90	46.4	56.41	66.4	16.80	48.6
Dec. 6.0	7.62	56.3	48.33	25.1	24.97	44.4	55.98	62.8	16.84	45.5
16.0	7.95	54.0	48.45	21.6	25.10	42.3	55.85	59.1	16.94	42.3
25.9	8.39	51.9	48.62	18.2	25.27	40.1	56.04	55.5	17.09	39.1
35.9	8.93	50.1	48.84	14.9	25.48	37.8	56.53	52.0	17.29	35.9

# FIXED STARS, 1910.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\gamma$ Ophiuchi.		$\alpha^1$ Herculis.		$\pi$ Herculis.		$\theta$ Ophiuchi.		$\delta$ Ophiuchi.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 17 5	° -15 36	h m 17 10	° +14 29	h m 17 11	° +36 54	h m 17 16	° -24 54	h m 17 20	° -24 5
Jan. 0.9	10.55	51.8	30.48	26.9	52.53	28.6	26.32	38.0	49.80	36.8
10.9	10.79	52.7	30.69	24.5	52.74	25.4	26.57	38.3	50.04	37.2
20.9	11.06	53.7	30.94	22.3	52.99	22.5	26.85	38.7	50.32	37.6
30.9	11.36	54.7	31.21	20.2	53.28	19.8	27.16	39.2	50.62	38.1
Feb. 9.8	11.67	55.6	31.49	18.4	53.60	17.6	27.48	39.8	50.94	38.7
19.8	11.99	56.4	31.79	17.0	53.93	15.9	27.81	40.3	51.27	39.2
Mar. 1.8	12.31	57.1	32.10	16.0	54.27	14.8	28.15	40.8	51.61	39.7
11.8	12.62	57.7	32.40	15.4	54.61	14.2	28.49	41.4	51.94	40.2
21.7	12.93	58.2	32.70	15.2	54.94	14.3	28.82	41.8	52.27	40.6
31.7	13.23	58.5	32.98	15.5	55.27	14.9	29.14	42.2	52.59	41.0
Apr. 10.7	13.52	58.7	33.25	16.2	55.57	16.0	29.45	42.5	52.90	41.3
20.6	13.79	58.7	33.51	17.2	55.85	17.7	29.75	42.8	53.20	41.5
30.6	14.04	58.6	33.74	18.6	56.10	19.7	30.02	43.1	53.48	41.7
May 10.6	14.26	58.2	33.95	20.2	56.32	22.1	30.27	43.3	53.73	41.9
20.6	14.46	58.2	34.13	22.0	56.50	24.7	30.50	43.6	53.96	42.0
30.5	14.63	57.9	34.28	23.9	56.65	27.5	30.69	43.8	54.15	42.2
June 9.5	14.77	57.7	34.40	25.8	56.75	30.3	30.85	44.1	54.31	42.4
19.5	14.87	57.4	34.48	27.7	56.80	33.0	30.97	44.3	54.44	42.6
29.5	14.94	57.2	34.53	29.5	56.81	35.7	31.05	44.6	54.53	42.8
July 9.4	14.97	57.0	34.53	31.2	56.78	38.1	31.09	44.9	54.57	43.0
19.4	14.95	56.8	34.50	32.7	56.70	40.3	31.09	45.1	54.57	43.3
29.4	14.90	56.6	34.43	34.0	56.58	42.2	31.04	45.4	54.52	43.5
Aug. 8.3	14.82	56.5	34.33	35.1	56.42	43.8	30.96	45.6	54.44	43.7
18.3	14.70	56.4	34.20	35.9	56.23	45.0	30.84	45.8	54.33	43.9
28.3	14.56	56.3	34.05	36.4	56.02	45.8	30.69	45.9	54.18	44.0
Sept. 7.3	14.40	56.2	33.88	36.7	55.78	46.1	30.52	46.0	54.02	44.1
17.2	14.23	56.1	33.70	36.7	55.54	46.0	30.35	45.9	53.84	44.0
27.2	14.07	56.0	33.52	36.4	55.30	45.5	30.17	45.8	53.67	43.9
Oct. 7.2	13.92	56.0	33.35	35.8	55.07	44.5	30.01	45.6	53.50	43.8
17.2	13.79	56.0	33.20	34.9	54.86	43.1	29.86	45.3	53.36	43.6
27.1	13.69	56.1	33.08	33.7	54.69	41.3	29.75	45.1	53.25	43.4
Nov. 6.1	13.63	56.2	33.00	32.2	54.55	39.0	29.68	44.8	53.17	43.1
16.1	13.62	56.5	32.96	30.4	54.46	36.4	29.66	44.5	53.14	42.9
26.0	13.66	56.8	32.97	28.4	54.43	33.5	29.69	44.3	53.17	42.8
Dec. 6.0	13.74	57.3	33.03	26.2	54.45	30.4	29.77	44.2	53.25	42.7
16.0	13.88	58.0	33.13	23.9	54.53	27.1	29.90	44.2	53.38	42.8
26.0	14.06	58.7	33.28	21.4	54.67	23.8	30.09	44.4	53.56	43.0
35.9	14.29	59.6	33.48	19.0	54.85	20.5	30.32	44.6	53.78	43.2

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Aræ.		β Draconis.		α Ophiuchi.		ε Herculis.		ω Draconis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 17 22	° ' " -60 36	h m 17 28	° ' " +52 21	h m 17 30	° ' " +12 37	h m 17 36	° ' " +46 2	h m 17 37	° ' " +68 47
	s	"	s	"	s	"	s	"	s	"
Jan. 1.0	53.89	33.1	21.42	55.4	43.21	24.3	53.10	66.2	25.15	50.3
	.40	1.6	.20	3.5	.20	2.3	.18	3.4	.23	3.6
10.9	54.29	31.5	21.62	51.9	43.41	22.0	53.28	62.8	25.38	46.7
	.46	1.4	.27	3.3	.23	2.2	.24	3.2	.33	3.4
20.9	54.75	30.1	21.89	48.6	43.64	19.8	53.52	59.6	25.71	43.3
	.51	1.1	.31	2.9	.25	2.0	.29	3.0	.43	3.0
30.9	55.26	29.0	22.20	45.7	43.89	17.8	53.81	56.6	26.14	40.3
	.54	.7	.36	2.5	.28	1.8	.32	2.4	.51	2.6
Feb. 9.8	55.80	28.3	22.56	43.2	44.17	16.0	54.13	54.2	26.65	37.7
	.58	.5	.39	1.9	.29	1.4	.35	2.0	.57	2.0
19.8	56.38	27.8	22.95	41.3	44.46	14.6	54.48	52.2	27.22	35.7
	.59	.1	.41	1.3	.30	1.0	.36	1.4	.62	1.4
Mar. 1.8	56.97	27.7	23.36	40.0	44.76	13.6	54.84	50.8	27.84	34.3
	.59	.2	.41	.7	.30	.7	.38	.7	.64	.7
11.8	57.56	27.9	23.77	39.3	45.06	12.9	55.22	50.1	28.48	33.6
	.58	.6	.42	.0	.30	.2	.37	.5	.65	.1
21.7	58.14	28.5	24.19	39.3	45.36	12.7	55.59	50.0	29.13	33.5
	.57	.8	.40	.6	.29	.2	.37	.5	.63	.6
31.7	58.71	29.3	24.59	39.9	45.65	12.9	55.96	50.5	29.76	34.1
	.55	1.1	.38	1.2	.28	.7	.35	1.1	.59	1.3
Apr. 10.7	59.26	30.4	24.97	41.1	45.93	13.6	56.31	51.6	30.35	35.4
	.52	1.3	.35	1.8	.26	.9	.32	1.6	.55	1.8
20.7	59.78	31.7	25.32	42.9	46.19	14.5	56.63	53.2	30.90	37.2
	.48	1.6	.31	2.3	.25	1.3	.29	2.1	.47	2.3
30.6	60.26	33.3	25.63	45.2	46.44	15.8	56.92	55.3	31.37	39.5
	.44	1.7	.27	2.6	.22	1.5	.26	2.5	.39	2.7
May 10.6	60.70	35.0	25.90	47.8	46.66	17.3	57.18	57.8	31.76	42.2
	.38	1.9	.21	2.9	.20	1.7	.22	2.8	.31	3.0
20.6	61.08	36.9	26.11	50.7	46.86	19.0	57.40	60.6	32.07	45.2
	.32	2.1	.17	3.1	.17	1.9	.18	3.0	.21	3.2
30.5	61.40	39.0	26.28	53.8	47.03	20.9	57.58	63.6	32.28	48.4
	.26	2.2	.11	3.2	.14	1.8	.12	3.1	.11	3.3
June 9.5	61.66	41.2	26.39	57.0	47.17	22.7	57.70	66.7	32.39	51.7
	.18	2.2	.04	3.2	.10	1.9	.07	3.0	.00	3.3
19.5	61.84	43.4	26.43	60.2	47.27	24.6	57.77	69.7	32.39	55.0
	.11	2.2	.01	3.0	.07	1.8	.02	3.0	.10	3.2
29.5	61.95	45.6	26.42	63.2	47.34	26.4	57.79	72.7	32.29	58.2
	.03	2.1	.08	2.9	.02	1.7	.04	2.9	.19	3.0
July 9.4	61.98	47.7	26.34	66.1	47.36	28.1	57.75	75.6	32.10	61.2
	.05	2.0	.13	2.6	.01	1.5	.09	2.6	.29	2.8
19.4	61.93	49.7	26.21	68.7	47.35	29.6	57.66	78.2	31.81	64.0
	.12	1.8	.18	2.3	.05	1.4	.14	2.3	.38	2.4
29.4	61.81	51.5	26.03	71.0	47.30	31.0	57.52	80.5	31.43	66.4
	.19	1.6	.23	1.9	.09	1.1	.18	1.9	.46	2.1
Aug. 8.4	61.62	53.1	25.80	72.9	47.21	32.1	57.34	82.4	30.97	68.5
	.26	1.2	.28	1.5	.12	0.9	.22	1.5	.52	1.6
18.3	61.36	54.3	25.52	74.4	47.09	33.0	57.12	83.9	30.45	70.1
	.30	.9	.31	1.0	.14	0.6	.26	1.1	.58	1.2
28.3	61.06	55.2	25.21	75.4	46.95	33.6	56.86	85.0	29.87	71.3
	.34	.6	.33	0.6	.17	.4	.28	.7	.62	.7
Sept. 7.3	60.72	55.8	24.88	76.0	46.78	34.0	56.58	85.7	29.25	72.0
	.35	.1	.34	.0	.17	.1	.29	.2	.64	.2
17.2	60.37	55.9	24.54	76.0	46.61	34.1	56.29	85.9	28.61	72.2
	.36	.4	.35	.4	.18	.2	.30	.3	.65	.4
27.2	60.01	55.5	24.19	75.6	46.43	33.9	55.99	85.6	27.96	71.8
	.34	.7	.34	1.0	.17	.5	.29	.8	.63	.9
Oct. 7.2	59.67	54.8	23.85	74.6	46.26	33.4	55.70	84.8	27.33	70.9
	.30	1.1	.32	1.4	.16	.8	.27	1.3	.60	1.4
17.2	59.37	53.7	23.53	73.2	46.10	32.6	55.43	83.5	26.73	69.5
	.25	1.4	.28	2.0	.13	1.1	.24	1.8	.55	1.9
27.1	59.12	52.3	23.25	71.2	45.97	31.5	55.19	81.7	26.18	67.6
	.18	1.8	.23	2.4	.09	1.3	.20	2.2	.49	2.4
Nov. 6.1	58.94	50.5	23.02	68.8	45.88	30.2	54.99	79.5	25.69	65.2
	.09	1.9	.18	2.8	.05	1.6	.15	2.6	.40	2.8
16.1	58.85	48.6	22.84	66.0	45.83	28.6	54.84	76.9	25.29	62.4
	.01	2.1	.12	3.1	.01	1.8	.10	2.9	.31	3.2
26.1	58.84	46.5	22.72	62.9	45.82	26.8	54.74	74.0	24.98	59.2
	.09	2.1	.04	3.4	.04	2.0	.03	3.3	.20	3.5
Dec. 6.0	58.93	44.4	22.68	59.5	45.86	24.8	54.71	70.7	24.78	55.7
	.19	2.1	.02	3.6	.09	2.2	.03	3.4	.08	3.6
16.0	59.12	42.3	22.70	55.9	45.95	22.6	54.74	67.3	24.70	52.1
	.27	2.0	.10	3.6	.13	2.3	.09	3.5	.04	3.7
26.0	59.39	40.3	22.80	52.3	46.08	20.3	54.83	63.8	24.74	48.4
	.35	1.8	.16	3.6	.17	2.4	.15	3.5	.15	3.7
35.9	59.74	38.5	22.96	48.7	46.25	17.9	54.98	60.3	24.89	44.7

# FIXED STARS, 1910.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\mu$ Herculis.		$\psi^2$ Draconis.		$\theta$ Herculis.		$\gamma$ Draconis.		$\gamma^2$ Sagittarii.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 17 42	° +27 46	h m 17 43	° +72 11	h m 17 53	° +37 15	h m 17 54	° +51 29	h m 17 59	° -30 25
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 1.0	53.95 .18	15.6 3.0	28.23 .22	27.7 3.6	7.69 .17	36.3 3.2	28.41 .17	49.7 3.5	58.81 .22	36.2 0.2
10.9	54.13 .21	12.6 2.8	28.45 .36	24.1 3.4	7.86 .21	33.1 3.1	28.58 .22	46.2 3.4	59.03 .25	36.0 0.2
20.9	54.34 .25	9.8 2.5	28.81 .47	20.7 3.1	8.07 .25	30.0 2.8	28.80 .28	42.8 3.1	59.28 .29	35.8 0.1
30.9	54.59 .28	7.3 2.2	29.28 .57	17.6 2.6	8.32 .28	27.2 2.4	29.08 .32	39.7 2.6	59.57 .31	35.7 0.0
Feb. 9.9	54.87 .29	5.1 1.7	29.85 .65	15.0 2.1	8.60 .31	24.8 2.0	29.40 .36	37.1 2.2	59.88 .33	35.7 0.0
19.8	55.16 .31	3.4 1.3	30.50 .71	12.9 1.5	8.91 .32	22.8 1.4	29.76 .39	34.9 1.5	60.21 .34	35.7 0.1
Mar. 1.8	55.47 .32	2.1 0.8	31.21 .74	11.4 0.8	9.23 .33	21.4 0.9	30.15 .40	33.4 1.0	60.55 .35	35.8 0.0
11.8	55.79 .31	1.3 0.2	31.95 .75	10.6 0.1	9.56 .34	20.5 0.3	30.55 .41	32.4 0.3	60.90 .35	35.8 0.1
21.7	56.10 .31	1.1 0.3	32.70 .73	10.5 0.5	9.90 .34	20.2 0.4	30.96 .40	32.1 0.4	61.25 .35	35.9 0.1
31.7	56.41 .30	1.4 0.8	33.43 .70	11.0 1.1	10.24 .32	20.6 0.9	31.36 .39	32.5 1.0	61.60 .34	36.0 0.1
Apr. 10.7	56.71 .28	2.2 1.3	34.13 .63	12.1 1.8	10.56 .31	21.5 1.4	31.75 .36	33.5 1.5	61.94 .33	36.1 0.1
20.7	56.99 .26	3.5 1.7	34.76 .56	13.9 2.2	10.87 .28	22.9 1.9	32.11 .34	35.0 2.1	62.27 .32	36.2 0.1
30.6	57.25 .24	5.2 2.0	35.32 .46	16.1 2.6	11.15 .26	24.8 2.2	32.45 .29	37.1 2.5	62.59 .30	36.3 0.2
May 10.6	57.49 .21	7.2 2.3	35.78 .36	18.7 3.0	11.41 .23	27.0 2.6	32.74 .25	39.6 2.8	62.89 .27	36.5 0.3
20.6	57.70 .17	9.5 2.5	36.14 .24	21.7 3.2	11.64 .18	29.6 2.7	32.99 .20	42.4 3.1	63.16 .25	36.8 0.3
30.6	57.87 .14	12.0 2.5	36.38 .12	24.9 3.2	11.82 .15	32.3 2.9	33.19 .14	45.5 3.2	63.41 .21	37.1 0.4
June 9.5	58.01 .10	14.5 2.5	36.50 .00	28.1 3.3	11.97 .10	35.2 2.9	33.33 .09	48.7 3.2	63.62 .17	37.5 0.4
19.5	58.11 .06	17.0 2.5	36.50 .12	31.4 3.2	12.07 .05	38.1 2.8	33.42 .03	51.9 3.1	63.79 .13	37.9 0.5
29.5	58.17 .01	19.5 2.3	36.38 .24	34.6 3.0	12.12 .01	40.9 2.7	33.45 .04	55.0 3.1	63.92 .09	38.4 0.5
July 9.4	58.18 .03	21.8 2.2	36.14 .35	37.6 2.8	12.13 .04	43.6 2.5	33.41 .09	58.1 2.8	64.01 .03	38.9 0.6
19.4	58.15 .07	24.0 1.9	35.79 .46	40.4 2.5	12.09 .09	46.1 2.3	33.32 .15	60.9 2.5	64.04 .01	39.5 0.6
29.4	58.08 .11	25.9 1.6	35.33 .55	42.9 2.1	12.00 .13	48.4 1.9	33.17 .20	63.4 2.2	64.03 .05	40.1 0.6
Aug. 8.4	57.97 .14	27.5 1.3	34.78 .63	45.0 1.7	11.87 .17	50.3 1.6	32.97 .25	65.6 1.8	63.98 .10	40.7 0.5
18.3	57.83 .17	28.8 0.9	34.15 .69	46.7 1.3	11.70 .20	51.9 1.2	32.72 .29	67.4 1.3	63.88 .14	41.2 0.4
28.3	57.66 .20	29.7 0.6	33.46 .74	48.0 0.7	11.50 .22	53.1 0.8	32.43 .32	68.7 0.9	63.74 .16	41.6 0.4
Sept. 7.3	57.46 .21	30.3 0.2	32.72 .77	48.7 0.3	11.28 .24	53.9 0.4	32.11 .33	69.6 0.4	63.58 .18	42.0 0.2
17.3	57.25 .21	30.5 0.2	31.95 .78	49.0 0.3	11.04 .25	54.3 0.1	31.78 .35	70.0 0.1	63.40 .19	42.2 0.1
27.2	57.04 .21	30.3 0.6	31.17 .76	48.7 0.9	10.79 .25	54.2 0.6	31.43 .34	69.9 0.6	63.21 .19	42.3 0.1
Oct. 7.2	56.83 .19	29.7 1.0	30.41 .74	47.8 1.3	10.54 .23	53.6 1.0	31.09 .32	69.3 1.1	63.02 .17	42.2 0.2
17.2	56.64 .17	28.7 1.4	29.67 .68	46.5 1.8	10.31 .21	52.6 1.4	30.77 .29	68.2 1.6	62.85 .14	42.0 0.3
27.1	56.47 .13	27.3 1.7	28.99 .60	44.7 2.3	10.10 .17	51.2 1.9	30.48 .26	66.6 2.1	62.71 .11	41.7 0.4
Nov. 6.1	56.34 .09	25.6 2.1	28.39 .51	42.4 2.8	9.93 .13	49.3 2.3	30.22 .20	64.5 2.5	62.60 .06	41.3 0.4
16.1	56.25 .05	23.5 2.4	27.88 .40	39.6 3.1	9.80 .08	47.0 2.6	30.02 .15	62.0 2.9	62.54 .02	40.9 0.5
26.1	56.20 .01	21.1 2.7	27.48 .28	36.5 3.4	9.72 .02	44.4 2.9	29.87 .08	59.1 3.2	62.52 .04	40.4 0.5
Dec. 6.0	56.21 .05	18.4 2.9	27.20 .14	33.1 3.6	9.70 .03	41.5 3.1	29.79 .01	55.9 3.4	62.56 .09	39.9 0.4
16.0	56.26 .11	15.5 2.9	27.06 .01	29.5 3.7	9.73 .08	38.4 3.2	29.78 .05	52.5 3.6	62.65 .15	39.5 0.4
26.0	56.37 .15	12.6 3.0	27.05 .14	25.8 3.7	9.81 .13	35.2 3.3	29.83 .13	48.9 3.6	62.80 .19	39.1 0.3
36.0	56.52 .15	9.6 3.0	27.19 .14	22.1 3.7	9.94 .13	31.9 3.3	29.96 .13	45.3 3.6	62.99 .19	38.8 0.3

FIXED STARS, 1910.  
(CONSTANTS OF STRUVE AND PETERS.)

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Herculis.			μ Sagittarii.			η Serpentis.			λ Sagittarii.			χ Draconis.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h	m	°	h	m	°	h	m	°	h	m	°	h	m	°
	18	3	+28 44	18	8	-21 5	18	16	- 2 55	18	22	-25 28	18	22	+72 41
	s	"	"	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 1.0	59.65		52.2	20.32		3.1	36.83		27.0	22.39		24.7	36.63		32.5
	.15		2.9	.19		0.3	.16		1.4	.19		0.1	.10		3.7
11.0	59.80		49.3	20.51		3.4	36.99		28.4	22.58		24.6	36.73		28.8
	.20		2.8	.23		0.3	.20		1.3	.22		0.0	.24		3.5
20.9	60.00		46.5	20.74		3.7	37.19		29.7	22.80		24.6	36.97		25.3
	.23		2.6	.26		0.3	.23		1.3	.25		0.0	.37		3.3
30.9	60.23		43.9	21.00		4.0	37.42		31.0	23.05		24.6	37.34		22.0
	.26		2.3	.28		0.3	.25		1.1	.28		0.1	.49		2.9
Feb. 9.9	60.49		41.6	21.28		4.3	37.67		32.1	23.33		24.7	37.83		19.1
	.28		1.8	.30		0.3	.27		0.9	.31		0.0	.59		2.5
19.8	60.77		39.8	21.58		4.6	37.94		33.0	23.64		24.7	38.42		16.6
	.30		1.4	.31		0.2	.28		0.7	.31		0.0	.67		2.0
Mar. 1.8	61.07		38.4	21.89		4.8	38.22		33.7	23.95		24.7	39.09		14.6
	.31		0.9	.32		0.1	.30		0.5	.33		0.1	.72		1.3
11.8	61.38		37.5	22.21		4.9	38.52		34.2	24.28		24.6	39.81		13.3
	.32		0.3	.33		0.1	.29		0.1	.33		0.1	.76		0.6
21.8	61.70		37.2	22.54		5.0	38.81		34.3	24.61		24.5	40.57		12.7
	.32		0.2	.33		0.1	.30		0.1	.34		0.1	.77		0.0
31.7	62.02		37.4	22.86		4.9	39.11		34.2	24.95		24.4	41.34		12.7
	.30		0.8	.32		0.1	.29		0.4	.33		0.2	.75		0.7
Apr. 10.7	62.32		38.2	23.18		4.8	39.40		33.8	25.28		24.2	42.09		13.4
	.30		1.2	.31		0.2	.29		0.6	.33		0.2	.70		1.3
20.7	62.62		39.4	23.49		4.6	39.69		33.2	25.61		24.0	42.79		14.7
	.28		1.7	.30		0.2	.28		0.8	.32		0.2	.64		1.8
30.7	62.90		41.1	23.79		4.4	39.97		32.4	25.93		23.8	43.43		16.5
	.25		2.0	.29		0.3	.26		1.0	.30		0.1	.57		2.4
May 10.6	63.15		43.1	24.08		4.1	40.23		31.4	26.23		23.7	44.00		18.9
	.23		2.3	.26		0.3	.24		1.1	.28		0.2	.47		2.7
20.6	63.38		45.4	24.34		3.8	40.47		30.3	26.51		23.5	44.47		21.6
	.20		2.5	.23		0.2	.22		1.2	.25		0.1	.36		3.1
30.6	63.58		47.9	24.57		3.6	40.69		29.1	26.76		23.4	44.83		24.7
	.16		2.6	.20		0.2	.19		1.2	.22		0.0	.24		3.2
June 9.5	63.74		50.5	24.77		3.4	40.88		27.9	26.98		23.4	45.07		27.9
	.12		2.7	.17		0.1	.15		1.2	.19		0.1	.11		3.3
19.5	63.86		53.2	24.94		3.3	41.03		26.7	27.17		23.5	45.18		31.2
	.08		2.6	.13		0.1	.12		1.2	.15		0.1	.01		3.4
29.5	63.94		55.8	25.07		3.2	41.15		25.5	27.32		23.6	45.17		34.6
	.03		2.5	.09		0.0	.08		1.0	.10		0.2	.13		3.2
July 9.5	63.97		58.3	25.16		3.2	41.23		24.5	27.42		23.8	45.04		37.8
	.01		2.3	.04		0.0	.04		1.0	.06		0.3	.26		3.1
19.4	63.96		60.6	25.20		3.2	41.27		23.5	27.48		24.1	44.78		40.9
	.06		2.1	.00		0.1	.00		0.8	.01		0.3	.38		2.9
29.4	63.90		62.7	25.20		3.3	41.27		22.7	27.49		24.4	44.40		43.8
	.10		1.8	.05		0.2	.04		0.6	.03		0.4	.48		2.6
Aug. 8.4	63.80		64.5	25.15		3.5	41.23		22.1	27.46		24.8	43.92		46.4
	.13		1.5	.08		0.2	.08		0.6	.08		0.4	.58		2.2
18.4	63.67		66.0	25.07		3.7	41.15		21.5	27.38		25.2	43.34		48.6
	.17		1.2	.12		0.1	.12		0.4	.12		0.4	.66		1.8
28.3	63.50		67.2	24.95		3.8	41.03		21.1	27.26		25.6	42.68		50.4
	.19		0.8	.15		0.2	.14		0.2	.14		0.3	.72		1.3
Sept. 7.3	63.31		68.0	24.80		4.0	40.89		20.9	27.12		25.9	41.96		51.7
	.21		0.4	.16		0.1	.16		0.1	.17		0.2	.77		0.8
17.3	63.10		68.4	24.64		4.1	40.73		20.8	26.95		26.1	41.19		52.5
	.21		0.0	.18		0.1	.16		0.1	.18		0.2	.80		0.4
27.2	62.89		68.4	24.46		4.2	40.57		20.9	26.77		26.3	40.39		52.9
	.22		0.4	.17		0.1	.17		0.2	.18		0.1	.80		0.2
Oct. 7.2	62.67		68.0	24.29		4.3	40.40		21.1	26.59		26.4	39.59		52.7
	.20		0.8	.16		0.0	.16		0.3	.17		0.0	.79		0.7
17.2	62.47		67.2	24.13		4.3	40.24		21.4	26.42		26.4	38.80		52.0
	.18		1.2	.13		0.0	.14		0.5	.15		0.0	.75		1.3
27.2	62.29		66.0	24.00		4.3	40.10		21.9	26.27		26.4	38.05		50.7
	.15		1.6	.11		0.0	.11		0.6	.11		0.2	.69		1.7
Nov. 6.1	62.14		64.4	23.89		4.3	39.99		22.5	26.16		26.2	37.36		49.0
	.11		2.0	.07		0.0	.07		0.8	.08		0.1	.62		2.3
16.1	62.03		62.4	23.82		4.3	39.92		23.3	26.08		26.1	36.74		46.7
	.06		2.3	.03		0.0	.03		1.0	.03		0.2	.51		2.7
26.1	61.97		60.1	23.80		4.3	39.89		24.3	26.05		25.9	36.23		44.0
	.02		2.5	.03		0.1	.01		1.1	.01		0.2	.40		3.0
Dec. 6.1	61.95		57.6	23.83		4.4	39.90		25.4	26.06		25.7	35.83		41.0
	.03		2.8	.08		0.1	.06		1.2	.07		0.2	.27		3.4
16.0	61.98		54.8	23.91		4.5	39.96		26.6	26.13		25.5	35.56		37.6
	.08		2.9	.13		0.2	.10		1.3	.12		0.1	.13		3.6
26.0	62.06		51.9	24.04		4.7	40.06		27.9	26.25		25.4	35.43		34.0
	.13		2.9	.17		0.2	.14		1.3	.16		0.1	.01		3.6
36.0	62.19		49.0	24.21		4.9	40.20		29.2	26.41		25.3	35.44		30.4

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Aquilæ.		$\zeta$ Pavonis.		$\alpha$ Lyræ. ( <i>I'ega.</i> )		$\beta$ Lyræ.		$\gamma$ Draconis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 18 30	° ' " 8 18	h m 18 32	° ' " -71 30	h m 18 33	° ' " +38 41	h m 18 46	° ' " +33 15	h m 18 49	° ' " +75 19
	s	"	s	"	s	"	s	"	s	"
Jan. 1.0	16.22	32.9	24.99	27.2	51.10	52.3	43.10	22.3	12.05	36.9
	.16	1.0	.38	2.6	.12	3.2	.10	3.0	.01	3.6
11.0	16.38	33.9	25.37	24.6	51.22	49.1	43.20	19.3	12.04	33.3
	.19	1.0	.48	2.5	.16	3.1	.15	2.9	.15	3.5
21.0	16.57	34.9	25.85	22.1	51.38	46.0	43.35	16.4	12.19	29.8
	.22	0.9	.59	2.2	.21	3.0	.19	2.8	.32	3.4
30.9	16.79	35.8	26.44	19.9	51.59	43.0	43.54	13.6	12.51	26.4
	.25	0.8	.68	2.0	.24	2.6	.23	2.5	.47	3.1
Feb. 9.9	17.04	36.6	27.12	17.9	51.83	40.4	43.77	11.1	12.98	23.3
	.27	0.6	.76	1.7	.28	2.2	.26	2.1	.60	2.7
19.9	17.31	37.2	27.88	16.2	52.11	38.2	44.03	9.0	13.58	20.6
	.28	0.5	.81	1.3	.31	1.7	.28	1.7	.71	2.2
Mar. 1.8	17.59	37.7	28.69	14.9	52.42	36.5	44.31	7.3	14.29	18.4
	.29	0.3	.85	1.0	.32	1.1	.30	1.2	.79	1.6
11.8	17.88	38.0	29.54	13.9	52.74	35.4	44.61	6.1	15.08	16.8
	.30	0.0	.87	0.6	.34	0.6	.32	0.6	.85	1.0
21.8	18.18	38.0	30.41	13.3	53.08	34.8	44.93	5.5	15.93	15.8
	.30	0.1	.88	0.3	.34	0.0	.32	0.0	.88	0.3
31.8	18.48	37.9	31.29	13.0	53.42	34.8	45.25	5.5	16.81	15.5
	.30	0.4	.88	0.2	.34	0.7	.33	0.5	.87	0.3
Apr. 10.7	18.78	37.5	32.17	13.2	53.76	35.5	45.58	6.0	17.68	15.8
	.30	0.6	.85	0.6	.33	1.1	.32	1.1	.84	1.0
20.7	19.08	36.9	33.02	13.8	54.09	36.6	45.90	7.1	18.52	16.8
	.29	0.7	.82	0.9	.32	1.7	.30	1.5	.79	1.6
30.7	19.37	36.2	33.84	14.7	54.41	38.3	46.20	8.6	19.31	18.4
	.28	0.9	.77	1.3	.29	2.1	.29	1.9	.70	2.1
May 10.6	19.65	35.3	34.61	16.0	54.70	40.4	46.49	10.5	20.01	20.5
	.26	0.9	.71	1.6	.26	2.5	.27	2.3	.60	2.5
20.6	19.91	34.4	35.32	17.6	54.96	42.9	46.76	12.8	20.61	23.0
	.23	1.0	.63	1.9	.23	2.7	.24	2.6	.48	2.9
30.6	20.14	33.4	35.95	19.5	55.19	45.6	47.00	15.4	21.09	25.9
	.21	1.0	.54	2.1	.19	3.0	.20	2.8	.35	3.1
June 9.6	20.35	32.4	36.49	21.6	55.38	48.6	47.20	18.2	21.44	29.0
	.17	1.0	.43	2.4	.15	3.0	.16	2.9	.20	3.3
19.5	20.52	31.4	36.92	24.0	55.53	51.6	47.36	21.1	21.64	32.3
	.14	0.9	.32	2.5	.10	3.0	.12	2.9	.06	3.4
29.5	20.66	30.5	37.24	26.5	55.63	54.6	47.48	24.0	21.70	35.7
	.10	0.7	.20	2.5	.05	2.9	.07	2.8	.09	3.4
July 9.5	20.76	29.8	37.44	29.0	55.68	57.5	47.55	26.8	21.61	39.1
	.05	0.7	.07	2.6	.00	2.8	.02	2.7	.24	3.2
19.5	20.81	29.1	37.51	31.6	55.68	60.3	47.57	29.5	21.37	42.3
	.01	0.6	.05	2.5	.05	2.6	.02	2.5	.38	3.1
29.4	20.82	28.5	37.46	34.1	55.63	62.9	47.55	32.0	20.99	45.4
	.03	0.5	.18	2.4	.10	2.3	.07	2.2	.52	2.9
Aug. 8.4	20.79	28.0	37.28	36.5	55.53	65.2	47.48	34.2	20.47	48.3
	.07	0.3	.29	2.1	.15	2.0	.12	2.0	.63	2.5
18.4	20.72	27.7	36.99	38.6	55.38	67.2	47.36	36.2	19.84	50.8
	.10	0.3	.39	1.8	.18	1.7	.15	1.6	.73	2.2
28.4	20.62	27.4	36.60	40.4	55.20	68.9	47.21	37.8	19.11	53.0
	.13	0.1	.47	1.4	.21	1.2	.19	1.2	.82	1.7
Sept. 7.3	20.49	27.3	36.13	41.8	54.99	70.1	47.02	39.0	18.29	54.7
	.15	0.0	.54	1.0	.24	0.8	.21	0.9	.89	1.3
17.3	20.34	27.3	35.59	42.8	54.75	70.9	46.81	39.9	17.40	56.0
	.17	0.1	.58	0.6	.25	0.4	.22	0.4	.94	0.8
27.3	20.17	27.4	35.01	43.4	54.50	71.3	46.59	40.3	16.46	56.8
	.16	0.2	.58	0.0	.26	0.1	.23	0.0	.96	0.3
Oct. 7.2	20.01	27.6	34.43	43.4	54.24	71.2	46.36	40.3	15.50	57.1
	.16	0.2	.57	0.5	.25	0.6	.23	0.3	.95	0.3
17.2	19.85	27.8	33.86	42.9	53.99	70.6	46.13	40.0	14.55	56.8
	.14	0.4	.52	1.0	.23	1.0	.21	0.9	.93	0.8
27.2	19.71	28.2	33.34	41.9	53.76	69.6	45.92	39.1	13.62	56.0
	.12	0.4	.45	1.5	.20	1.5	.19	1.3	.88	1.3
Nov. 6.2	19.59	28.6	32.89	40.4	53.56	68.1	45.73	37.8	12.74	54.7
	.08	0.6	.35	1.8	.17	1.9	.15	1.7	.80	1.9
16.1	19.51	29.2	32.54	38.6	53.39	66.2	45.58	36.1	11.94	52.8
	.04	0.6	.24	2.2	.12	2.3	.12	2.1	.69	2.3
26.1	19.47	29.8	32.30	36.4	53.27	63.9	45.46	34.0	11.25	50.5
	.01	0.8	.11	2.5	.08	2.6	.07	2.4	.58	2.8
Dec. 6.1	19.48	30.6	32.19	33.9	53.19	61.3	45.39	31.6	10.67	47.7
	.05	0.8	.03	2.6	.02	2.9	.02	2.7	.43	3.1
16.0	19.53	31.4	32.22	31.3	53.17	58.4	45.37	28.9	10.24	44.6
	.09	0.9	.16	2.7	.03	3.1	.02	2.8	.28	3.3
26.0	19.62	32.3	32.38	28.6	53.20	55.3	45.39	26.1	9.96	41.3
	.14	1.0	.30	2.7	.08	3.2	.08	3.0	.12	3.6
36.0	19.76	33.3	32.68	25.9	53.28	52.1	45.47	23.1	9.84	37.7

## FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\sigma$ Sagittarii.		$\gamma$ Lyrae.		$\zeta$ Aquilæ.		$\epsilon$ Lyrae.		$\delta$ Sagittarii.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 18 49	° ' " -26 24	h m 18 55	° ' " +32 33	h m 19 1	° ' " +13 43	h m 19 4	° ' " +35 57	h m 19 12	° ' " -19 6
Jan. 1.0	38.47	39.7	32.28	50.9	14.16	38.9	3.08	25.8	19.73	56.9
11.0	38.62	39.5	32.37	47.9	14.27	36.8	3.16	22.7	19.86	57.0
21.0	38.82	39.3	32.51	45.0	14.41	34.7	3.28	19.7	20.02	57.2
30.9	39.05	39.1	32.69	42.3	14.59	32.7	3.46	16.8	20.22	57.3
Feb. 9.9	39.31	38.9	32.91	39.8	14.80	30.9	3.67	14.2	20.44	57.3
19.9	39.60	38.7	33.16	37.6	15.04	29.5	3.91	11.9	20.69	57.3
Mar. 1.9	39.90	38.4	33.43	35.9	15.29	28.3	4.19	10.1	20.97	57.1
11.8	40.22	38.1	33.73	34.7	15.56	27.5	4.49	8.8	21.26	56.9
21.8	40.55	37.8	34.04	34.1	15.85	27.2	4.80	8.0	21.56	56.5
31.8	40.88	37.4	34.36	34.0	16.14	27.3	5.13	7.8	21.88	56.0
Apr. 10.7	41.22	37.0	34.68	34.4	16.44	27.7	5.46	8.2	22.20	55.5
20.7	41.56	36.6	35.00	35.4	16.74	28.6	5.79	9.2	22.52	54.8
30.7	41.89	36.2	35.31	36.9	17.03	29.9	6.11	10.7	22.84	54.1
May 10.7	42.21	35.9	35.61	38.8	17.31	31.4	6.42	12.6	23.15	53.3
20.6	42.51	35.6	35.88	41.1	17.58	33.2	6.70	14.9	23.45	52.6
30.6	42.79	35.3	36.13	43.7	17.82	35.2	6.96	17.5	23.73	51.9
June 9.6	43.04	35.2	36.34	46.4	18.03	37.3	7.18	20.3	23.98	51.2
19.6	43.26	35.2	36.51	49.2	18.22	39.5	7.36	23.2	24.20	50.7
29.5	43.43	35.2	36.64	52.1	18.37	41.6	7.50	26.2	24.39	50.2
July 9.5	43.56	35.4	36.72	54.9	18.47	43.7	7.58	29.2	24.54	49.9
19.5	43.64	35.7	36.75	57.7	18.54	45.6	7.62	32.0	24.64	49.7
29.4	43.68	36.1	36.74	60.2	18.56	47.4	7.61	34.7	24.70	49.6
Aug. 8.4	43.67	36.6	36.68	62.5	18.53	49.0	7.55	37.1	24.71	49.7
18.4	43.62	37.0	36.57	64.5	18.47	50.4	7.44	39.3	24.67	49.8
28.4	43.52	37.5	36.43	66.2	18.37	51.5	7.29	41.2	24.59	50.0
Sept. 7.3	43.39	37.9	36.25	67.5	18.24	52.4	7.10	42.6	24.48	50.3
17.3	43.23	38.3	36.04	68.4	18.08	52.9	6.89	43.7	24.34	50.6
27.3	43.05	38.6	35.82	68.9	17.91	53.2	6.66	44.4	24.18	50.8
Oct. 7.3	42.87	38.9	35.60	69.0	17.73	53.2	6.42	44.6	24.01	51.1
17.2	42.70	39.0	35.37	68.7	17.55	52.9	6.18	44.4	23.85	51.4
27.2	42.54	39.0	35.16	67.9	17.38	52.3	5.95	43.7	23.69	51.6
Nov. 6.2	42.41	38.9	34.97	66.7	17.24	51.4	5.75	42.5	23.56	51.8
16.1	42.31	38.8	34.81	65.1	17.12	50.3	5.57	41.0	23.45	52.0
26.1	42.25	38.6	34.69	63.1	17.04	48.8	5.43	39.0	23.38	52.1
Dec. 6.1	42.24	38.3	34.62	60.8	17.00	47.2	5.34	36.6	23.35	52.3
16.1	42.28	38.1	34.59	58.2	17.00	45.3	5.29	34.0	23.37	52.4
26.0	42.37	37.8	34.60	55.4	17.04	43.3	5.30	31.1	23.43	52.6
36.0	42.50	37.6	34.67	52.5	17.13	41.2	5.35	28.1	23.53	52.7



# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Draconis.			θ Lyræ.			σ Octantis.			τ Draconis.			δ Aquilæ.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.
	h m	s	°	h m	s	°	h	m s	°	h m	s	°	h m	s	°
	19 12		+67 29	19 13		+37 58	19		-89 14	19 17		+73 10	19 20		+ 2 55
Jan. 1.0	28.57	.02	68.8	12.24	.07	18.7	14 21.9	3.4	26.2	12.93	.09	77.0	55.40	.10	58.5
11.0	28.55	.09	65.2	12.31	.11	15.6	14 25.3	6.4	22.8	12.84	.06	73.5	55.50	.13	57.0
21.0	28.64	.19	61.6	12.42	.16	12.5	14 31.7	9.3	19.5	12.90	.20	69.9	55.63	.17	55.6
30.9	28.83	.29	58.2	12.58	.20	9.6	14 41.0	11.8	16.3	13.10	.34	66.4	55.80	.20	54.3
Feb. 9.9	29.12	.38	55.0	12.78	.24	6.9	14 52.8	14.1	13.4	13.44	.46	63.2	56.00	.22	53.1
19.9	29.50	.46	52.1	13.02	.27	4.5	15 6.9	15.9	10.8	13.90	.57	60.3	56.22	.24	52.1
Mar. 1.9	29.96	.52	49.7	13.29	.30	2.6	15 22.8	17.4	8.5	14.47	.65	57.8	56.46	.26	51.3
11.8	30.48	.57	47.9	13.59	.32	1.2	15 40.2	18.4	6.7	15.12	.72	55.9	56.72	.28	50.9
21.8	31.05	.59	46.7	13.91	.33	0.3	15 58.6	19.0	5.3	15.84	.76	54.6	57.00	.29	50.8
31.8	31.64	.61	46.1	14.24	.34	0.1	16 17.6	19.4	4.4	16.60	.77	54.0	57.29	.29	51.0
Apr. 10.8	32.25	.60	46.2	14.58	.34	0.4	16 37.0	19.1	3.9	17.37	.77	54.0	57.58	.30	51.5
20.7	32.85	.57	47.0	14.92	.33	1.3	16 56.1	18.6	4.0	18.14	.73	54.6	57.88	.30	52.4
30.7	33.42	.53	48.3	15.25	.32	2.7	17 14.7	17.8	4.5	18.87	.68	55.9	58.18	.29	53.5
May 10.7	33.95	.47	50.3	15.57	.29	4.6	17 32.5	16.5	5.5	19.55	.60	57.7	58.47	.28	54.8
20.6	34.42	.41	52.7	15.86	.26	6.8	17 49.0	14.9	6.9	20.15	.50	60.0	58.75	.26	56.3
30.6	34.83	.32	55.5	16.12	.24	9.4	18 3.9	12.9	8.8	20.65	.40	62.7	59.01	.24	57.9
June 9.6	35.15	.23	58.6	16.36	.19	12.3	18 16.8	10.7	11.0	21.05	.28	65.8	59.25	.21	59.6
19.6	35.38	.14	61.9	16.55	.14	15.3	18 27.5	8.2	13.5	21.33	.15	69.1	59.46	.17	61.3
29.5	35.52	.04	65.3	16.69	.10	18.3	18 35.7	5.5	16.3	21.48	.02	72.5	59.63	.13	63.0
July 9.5	35.56	.06	68.8	16.79	.04	21.4	18 41.2	2.6	19.3	21.50	.11	75.9	59.76	.09	64.6
19.5	35.50	.16	72.2	16.83	.01	24.3	18 43.8	0.2	22.4	21.39	.23	79.3	59.85	.05	66.1
29.5	35.34	.25	75.5	16.82	.05	27.1	18 43.6	3.2	25.4	21.16	.35	82.6	59.90	.01	67.4
Aug. 8.4	35.09	.34	78.5	16.77	.11	29.7	18 40.4	6.0	28.4	20.81	.47	85.7	59.91	.04	68.6
18.4	34.75	.42	81.3	16.66	.15	32.0	18 34.4	8.6	31.2	20.34	.57	88.6	59.87	.07	69.5
28.4	34.33	.48	83.7	16.51	.18	34.0	18 25.8	10.9	33.7	19.77	.66	91.1	59.80	.11	70.3
Sept. 7.3	33.85	.54	85.8	16.33	.22	35.6	18 14.9	12.8	35.9	19.11	.73	93.2	59.69	.14	70.9
17.3	33.31	.58	87.4	16.11	.23	36.8	18 2.1	14.3	37.5	18.38	.78	94.9	59.55	.15	71.3
27.3	32.73	.60	88.5	15.88	.25	37.6	17 47.8	15.2	38.7	17.60	.82	96.1	59.40	.17	71.4
Oct. 7.3	32.13	.60	89.1	15.63	.25	37.9	17 32.6	15.4	39.2	16.78	.82	96.9	59.23	.16	71.4
17.2	31.53	.60	89.2	15.38	.24	37.8	17 17.2	15.1	39.2	15.96	.82	97.1	59.07	.15	71.1
27.2	30.93	.56	88.7	15.14	.22	37.2	17 2.1	14.1	38.5	15.14	.78	96.7	58.92	.14	70.7
Nov. 6.2	30.37	.52	87.7	14.92	.18	36.1	16 48.0	12.5	37.2	14.36	.73	95.8	58.78	.11	70.1
16.2	29.85	.45	86.1	14.74	.16	34.6	16 35.5	10.4	35.4	13.63	.65	94.3	58.67	.08	69.3
26.1	29.40	.38	84.0	14.58	.11	32.7	16 25.1	7.8	33.0	12.98	.56	92.3	58.59	.05	68.3
Dec. 6.1	29.02	.29	81.4	14.47	.06	30.3	16 17.3	5.0	30.2	12.42	.44	89.9	58.54	.00	67.2
16.1	28.73	.19	78.5	14.41	.02	27.7	16 12.3	1.8	27.1	11.98	.31	87.1	58.54	.04	65.9
26.0	28.54	.09	75.2	14.39	.04	24.9	16 10.5	1.4	23.8	11.67	.18	83.9	58.58	.07	64.5
36.0	28.45		71.8	14.43		21.9	16 11.9		20.4	11.49		80.5	58.65		63.1

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Cygni.		$\kappa$ Aquilæ.		$\beta$ Sagittæ.		$\gamma$ Aquilæ.		$\delta$ Cygni.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m	° '	h m	° '	h m	° '	h m	° '	h m	° '
	19 27	+27 45	19 32	- 7 13	19 36	+17 15	19 41	+10 23	19 42	+44 54
	s	"	s	"	s	"	s	"	s	"
Jan. 1.0	3.22	67.7	0.75	48.6	58.17	55.8	56.65	30.0	7.26	35.7
	.07	2.7	.09	0.8	.07	2.2	.07	1.8	.02	3.2
11.0	3.29	65.0	0.84	49.4	58.24	53.6	56.72	28.2	7.28	32.5
	.11	2.6	.13	0.8	.11	2.2	.11	1.8	.07	3.2
21.0	3.40	62.4	0.97	50.2	58.35	51.4	56.83	26.4	7.35	29.3
	.14	2.6	.17	0.7	.14	2.0	.14	1.7	.12	3.1
31.0	3.54	59.8	1.14	50.9	58.49	49.4	56.97	24.7	7.47	26.2
	.18	2.3	.19	0.6	.17	1.9	.17	1.6	.17	3.0
Feb. 9.9	3.72	57.5	1.33	51.5	58.66	47.5	57.14	23.1	7.64	23.2
	.22	2.1	.22	0.5	.21	1.7	.20	1.3	.22	2.6
19.9	3.94	55.4	1.55	52.0	58.87	45.8	57.34	21.8	7.86	20.6
	.25	1.7	.25	0.3	.23	1.3	.23	1.0	.26	2.3
Mar. 1.9	4.19	53.7	1.80	52.3	59.10	44.5	57.57	20.8	8.12	18.3
	.26	1.2	.26	0.1	.25	0.9	.25	0.7	.30	1.7
11.9	4.45	52.5	2.06	52.4	59.35	43.6	57.82	20.1	8.42	16.6
	.29	0.7	.28	0.2	.27	0.5	.27	0.3	.33	1.2
21.8	4.74	51.8	2.34	52.2	59.62	43.1	58.09	19.8	8.75	15.4
	.31	0.2	.29	0.4	.29	0.1	.28	0.0	.35	0.6
31.8	5.05	51.6	2.63	51.8	59.91	43.0	58.37	19.8	9.10	14.8
	.31	0.3	.30	0.6	.30	0.4	.29	0.5	.36	0.0
Apr. 10.8	5.36	51.9	2.93	51.2	60.21	43.4	58.66	20.3	9.46	14.8
	.32	0.8	.30	0.9	.30	0.8	.30	0.8	.37	0.6
20.7	5.68	52.7	3.23	50.3	60.51	44.2	58.96	21.1	9.83	15.4
	.31	1.3	.31	1.0	.30	1.2	.30	1.2	.36	1.2
30.7	5.99	54.0	3.54	49.3	60.81	45.4	59.26	22.3	10.19	16.6
	.30	1.7	.30	1.1	.30	1.6	.30	1.5	.36	1.7
May 10.7	6.29	55.7	3.84	48.2	61.11	47.0	59.56	23.8	10.55	18.3
	.29	2.1	.29	1.3	.29	1.9	.28	1.7	.33	2.2
20.7	6.58	57.8	4.13	46.9	61.40	48.9	59.84	25.5	10.88	20.5
	.26	2.4	.28	1.3	.26	2.1	.27	1.9	.31	2.6
30.6	6.84	60.2	4.41	45.6	61.66	51.0	60.11	27.4	11.19	23.1
	.24	2.5	.25	1.3	.25	2.3	.25	2.0	.27	2.9
June 9.6	7.08	62.7	4.66	44.3	61.91	53.3	60.36	29.4	11.46	26.0
	.20	2.7	.22	1.2	.21	2.3	.22	2.1	.22	3.0
19.6	7.28	65.4	4.88	43.1	62.12	55.6	60.58	31.5	11.68	29.0
	.17	2.8	.19	1.2	.17	2.4	.18	2.1	.18	3.3
29.6	7.45	68.2	5.07	41.9	62.29	58.0	60.76	33.3	11.86	32.3
	.12	2.7	.16	1.1	.14	2.3	.15	2.0	.13	3.2
July 9.5	7.57	70.9	5.23	40.8	62.43	60.3	60.91	35.6	11.99	35.5
	.07	2.7	.11	0.9	.10	2.2	.10	1.9	.07	3.3
19.5	7.64	73.6	5.34	39.9	62.53	62.5	61.01	37.5	12.06	38.8
	.03	2.5	.06	0.8	.05	2.1	.06	1.8	.01	3.1
29.5	7.67	76.1	5.40	39.1	62.58	64.6	61.07	39.3	12.07	41.9
	.02	2.3	.02	0.6	.00	1.9	.02	1.6	.04	2.9
Aug. 8.4	7.65	78.4	5.42	38.5	62.58	66.5	61.09	40.9	12.03	44.8
	.07	2.0	.02	0.5	.04	1.7	.02	1.4	.10	2.7
18.4	7.58	80.4	5.40	38.0	62.54	68.2	61.07	42.3	11.93	47.5
	.11	1.8	.06	0.3	.08	1.4	.07	1.2	.15	2.4
28.4	7.47	82.2	5.34	37.7	62.46	69.6	61.00	43.5	11.78	49.9
	.14	1.4	.10	0.2	.12	1.2	.10	0.9	.19	2.1
Sept. 7.4	7.33	83.6	5.24	37.5	62.34	70.8	60.90	44.4	11.59	52.0
	.17	1.2	.12	0.1	.14	0.9	.13	0.7	.23	1.6
17.3	7.16	84.8	5.12	37.4	62.20	71.7	60.77	45.1	11.36	53.6
	.20	0.7	.15	0.0	.16	0.5	.16	0.4	.26	1.2
27.3	6.96	85.5	4.97	37.4	62.04	72.2	60.61	45.5	11.10	54.8
	.20	0.4	.16	0.2	.18	0.3	.16	0.1	.28	0.8
Oct. 7.3	6.76	85.9	4.81	37.6	61.86	72.5	60.45	45.6	10.82	55.6
	.21	0.1	.16	0.3	.18	0.1	.17	0.1	.28	0.3
17.3	6.55	85.8	4.65	37.9	61.68	72.4	60.28	45.5	10.54	55.9
	.20	0.5	.15	0.3	.18	0.4	.17	0.3	.28	0.2
27.2	6.35	85.3	4.50	38.2	61.50	72.0	60.11	45.2	10.26	55.7
	.18	0.9	.14	0.5	.16	0.7	.15	0.7	.26	0.7
Nov. 6.2	6.17	84.4	4.36	38.7	61.34	71.3	59.96	44.5	10.00	55.0
	.16	1.2	.11	0.5	.13	1.0	.12	0.9	.24	1.3
16.2	6.01	83.2	4.25	39.2	61.21	70.3	59.84	43.6	9.76	53.7
	.12	1.6	.08	0.6	.11	1.4	.10	1.1	.20	1.7
26.1	5.89	81.6	4.17	39.8	61.10	68.9	59.74	42.5	9.56	52.0
	.09	2.0	.05	0.7	.07	1.6	.07	1.3	.17	2.1
Dec. 6.1	5.80	79.6	4.12	40.5	61.03	67.3	59.67	41.2	9.39	49.9
	.05	2.2	.00	0.7	.04	1.8	.03	1.5	.12	2.5
16.1	5.75	77.4	4.12	41.2	60.99	65.5	59.64	39.7	9.27	47.4
	.00	2.5	.03	0.8	.01	2.0	.01	1.7	.07	2.9
26.1	5.75	74.9	4.15	42.0	61.00	63.5	59.65	38.0	9.20	44.5
	.04	2.1	.08	0.8	.04	2.1	.05	1.8	.01	3.0
36.0	5.79	72.3	4.23	42.8	61.04	61.4	59.70	36.2	9.19	41.5

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Aquilæ.			$\epsilon$ Draconis.			$\epsilon$ Pavonis.			$\beta$ Aquilæ.			$\gamma$ Sagittæ.		
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion South.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.	
	h m 19 46	° + 8 37		h m 19 48	° + 70 1		h m 19 50	° - 73 8		h m 19 50	° + 6 10		h m 19 54	° + 19 14	
	s	"		s	"		s	"		s	"		s	"	
Jan. 1.1	21.34	.07	41.8	25.04	.14	78.8	5.57	.13	68.1	.07	46.6	.05	43.06	.05	44.8
11.0	21.41	.10	40.1	24.90	.02	75.4	5.70	.27	65.2	.10	45.0	.09	43.11	.09	42.6
21.0	21.51	.14	38.4	24.88	.10	71.9	5.97	.40	62.2	.14	43.4	.12	43.20	.12	40.4
31.0	21.65	.17	36.8	24.90	.22	68.4	6.37	.51	59.3	.16	42.0	.16	43.32	.16	38.3
Feb. 9.9	21.82	.20	35.4	25.20	.33	65.1	6.88	.62	56.5	.20	40.6	.19	43.48	.19	36.3
19.9	22.02	.22	34.2	25.53	.43	62.0	7.50	.71	53.8	.22	39.5	.21	43.67	.21	34.6
Mar. 1.9	22.24	.25	33.2	25.96	.51	59.3	8.21	.78	51.3	.24	38.7	.24	43.88	.24	33.2
11.9	22.49	.26	32.6	26.47	.58	57.1	8.99	.85	49.2	.26	38.1	.27	44.12	.27	32.2
21.8	22.75	.28	32.4	27.05	.63	55.5	9.84	.90	47.4	.28	37.9	.28	44.39	.28	31.6
31.8	23.03	.30	32.5	27.68	.66	54.5	10.74	.92	45.9	.29	38.1	.30	44.67	.30	31.4
Apr. 10.8	23.33	.30	33.0	28.34	.67	54.1	11.66	.94	44.8	.30	38.6	.30	44.97	.30	31.7
20.8	23.63	.30	33.8	29.01	.66	54.4	12.60	.95	44.2	.30	39.4	.31	45.27	.31	32.5
30.7	23.93	.30	35.0	29.67	.62	55.3	13.55	.92	43.9	.30	40.6	.30	45.58	.30	33.6
May 10.7	24.23	.29	36.4	30.29	.58	56.9	14.47	.88	44.1	.29	42.0	.29	45.88	.29	35.2
20.7	24.52	.27	38.1	30.87	.51	58.9	15.35	.83	44.7	.28	43.6	.28	46.18	.28	37.1
30.6	24.79	.25	40.0	31.38	.43	61.4	16.18	.76	45.7	.25	45.4	.25	46.46	.25	39.2
June 9.6	25.04	.23	42.0	31.81	.33	64.3	16.94	.67	47.1	.23	47.3	.23	46.71	.23	41.5
19.6	25.27	.19	44.0	32.14	.24	67.5	17.61	.56	48.9	.19	49.2	.19	46.94	.19	43.9
29.6	25.46	.15	46.0	32.38	.12	70.9	18.17	.45	50.9	.16	51.1	.16	47.13	.16	46.4
July 9.5	25.61	.11	48.0	32.50	.02	74.4	18.62	.31	53.2	.12	52.9	.12	47.28	.12	48.8
19.5	25.72	.07	49.9	32.52	.10	77.9	18.93	.17	55.7	.07	54.6	.07	47.39	.07	51.2
29.5	25.79	.02	51.6	32.42	.20	81.4	19.10	.04	58.3	.03	56.2	.03	47.46	.03	53.5
Aug. 8.5	25.81	.02	53.1	32.22	.31	84.7	19.14	.11	61.0	.01	57.6	.01	47.48	.01	55.6
18.4	25.79	.06	54.5	31.91	.40	87.8	19.03	.25	63.5	.06	58.8	.06	47.45	.06	57.4
28.4	25.73	.09	55.6	31.51	.48	90.7	18.78	.36	65.9	.09	59.8	.09	47.38	.09	59.0
Sept. 7.4	25.64	.13	56.5	31.03	.56	93.2	18.42	.47	68.1	.13	60.6	.13	47.28	.13	60.4
17.3	25.51	.15	57.1	30.47	.61	95.3	17.95	.55	70.0	.14	61.1	.14	47.14	.14	61.4
27.3	25.36	.16	57.5	29.86	.65	97.0	17.40	.61	71.4	.16	61.4	.16	46.98	.16	62.1
Oct. 7.3	25.20	.17	57.6	29.21	.67	98.2	16.79	.64	72.4	.16	61.5	.16	46.81	.16	62.5
17.3	25.03	.16	57.5	28.54	.67	98.8	16.15	.64	72.9	.16	61.4	.16	46.63	.16	62.6
27.2	24.87	.14	57.2	27.87	.66	98.9	15.51	.60	72.8	.15	61.0	.15	46.45	.15	62.3
Nov. 6.2	24.73	.13	56.6	27.21	.63	98.5	14.91	.54	72.2	.12	60.4	.12	46.28	.12	61.7
16.2	24.60	.10	55.8	26.58	.57	97.5	14.37	.45	71.1	.10	59.6	.10	46.14	.10	60.7
26.2	24.50	.06	54.7	26.01	.50	95.9	13.92	.35	69.5	.07	58.6	.07	46.02	.07	59.5
Dec. 6.1	24.44	.03	53.5	25.51	.42	93.8	13.57	.22	67.5	.03	57.5	.03	45.93	.03	58.0
16.1	24.41	.01	52.0	25.09	.32	91.2	13.35	.09	65.1	.01	56.2	.01	45.88	.01	56.2
26.1	24.42	.05	50.5	24.77	.21	88.3	13.26	.05	62.4	.05	54.7	.05	45.87	.05	54.2
36.0	24.47		48.9	24.56		85.1	13.31		59.5		53.2		45.89		52.1

## FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♐ Sagittarii.		♏ Aquilæ.		♏ Aquilæ.		♏ Cygni.		♏ Cephei (pr.).	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 19 57	° -27 57	h m 19 59	° + 7 1	h m 20 6	° - 1 5	h m 20 10	° +46 27	h m 20 11	° +77 26
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 1.1	5.06 <sub>.08</sub>	48.8 <sub>0.5</sub>	42.44 <sub>.06</sub>	18.6 <sub>1.6</sub>	37.51 <sub>.06</sub>	27.9 <sub>1.1</sub>	45.39 <sub>.02</sub>	63.5 <sub>3.0</sub>	50.57 <sub>0.38</sub>	28.2 <sub>3.2</sub>
11.0	5.14 <sub>.13</sub>	48.3 <sub>0.6</sub>	42.50 <sub>.09</sub>	17.0 <sub>1.5</sub>	37.57 <sub>.09</sub>	29.0 <sub>1.0</sub>	45.37 <sub>.03</sub>	60.5 <sub>3.2</sub>	50.19 <sub>0.20</sub>	25.0 <sub>3.4</sub>
21.0	5.27 <sub>.16</sub>	47.7 <sub>0.6</sub>	42.59 <sub>.13</sub>	15.5 <sub>1.5</sub>	37.66 <sub>.13</sub>	30.0 <sub>1.0</sub>	45.40 <sub>.08</sub>	57.3 <sub>3.1</sub>	49.99 <sub>0.01</sub>	21.6 <sub>3.4</sub>
31.0	5.43 <sub>.20</sub>	47.1 <sub>0.7</sub>	42.72 <sub>.16</sub>	14.0 <sub>1.4</sub>	37.79 <sub>.15</sub>	31.0 <sub>0.9</sub>	45.48 <sub>.13</sub>	54.2 <sub>3.0</sub>	49.98 <sub>0.18</sub>	18.2 <sub>3.4</sub>
Feb. 10.0	5.63 <sub>.22</sub>	46.4 <sub>0.8</sub>	42.88 <sub>.18</sub>	12.6 <sub>1.1</sub>	37.94 <sub>.19</sub>	31.9 <sub>0.7</sub>	45.61 <sub>.19</sub>	51.2 <sub>2.8</sub>	50.16 <sub>0.37</sub>	14.8 <sub>3.2</sub>
19.9	5.85 <sub>.26</sub>	45.6 <sub>0.8</sub>	43.06 <sub>.21</sub>	11.5 <sub>0.8</sub>	38.13 <sub>.21</sub>	32.6 <sub>0.4</sub>	45.80 <sub>.23</sub>	48.4 <sub>2.4</sub>	50.53 <sub>0.54</sub>	11.6 <sub>2.9</sub>
Mar. 1.9	6.11 <sub>.28</sub>	44.8 <sub>0.9</sub>	43.27 <sub>.24</sub>	10.7 <sub>0.6</sub>	38.34 <sub>.23</sub>	33.0 <sub>0.2</sub>	46.03 <sub>.28</sub>	46.0 <sub>2.0</sub>	51.07 <sub>0.69</sub>	8.7 <sub>2.4</sub>
11.9	6.39 <sub>.30</sub>	43.9 <sub>0.9</sub>	43.51 <sub>.26</sub>	10.1 <sub>0.2</sub>	38.57 <sub>.26</sub>	33.2 <sub>0.1</sub>	46.31 <sub>.31</sub>	44.0 <sub>1.4</sub>	51.76 <sub>0.81</sub>	6.3 <sub>2.0</sub>
21.8	6.69 <sub>.32</sub>	43.0 <sub>1.0</sub>	43.77 <sub>.27</sub>	9.9 <sub>0.1</sub>	38.83 <sub>.27</sub>	33.1 <sub>0.3</sub>	46.62 <sub>.34</sub>	42.6 <sub>0.9</sub>	52.57 <sub>0.91</sub>	4.3 <sub>1.3</sub>
31.8	7.11 <sub>.33</sub>	42.0 <sub>0.9</sub>	44.04 <sub>.29</sub>	10.0 <sub>0.5</sub>	39.10 <sub>.29</sub>	32.8 <sub>0.7</sub>	46.96 <sub>.36</sub>	41.7 <sub>0.2</sub>	53.48 <sub>0.97</sub>	3.0 <sub>0.7</sub>
Apr. 10.8	7.34 <sub>.34</sub>	41.1 <sub>1.0</sub>	44.33 <sub>.30</sub>	10.5 <sub>0.9</sub>	39.39 <sub>.30</sub>	32.1 <sub>0.9</sub>	47.32 <sub>.37</sub>	41.5 <sub>0.3</sub>	54.45 <sub>1.00</sub>	2.3 <sub>0.1</sub>
20.8	7.68 <sub>.35</sub>	40.1 <sub>0.9</sub>	44.63 <sub>.30</sub>	11.4 <sub>1.1</sub>	39.69 <sub>.31</sub>	31.2 <sub>1.1</sub>	47.69 <sub>.38</sub>	41.8 <sub>0.9</sub>	55.45 <sub>1.00</sub>	2.2 <sub>0.5</sub>
30.7	8.03 <sub>.35</sub>	39.2 <sub>0.9</sub>	44.93 <sub>.30</sub>	12.5 <sub>1.5</sub>	40.00 <sub>.30</sub>	30.1 <sub>1.4</sub>	48.07 <sub>.37</sub>	42.7 <sub>1.5</sub>	56.45 <sub>0.96</sub>	2.7 <sub>1.2</sub>
May 10.7	8.38 <sub>.34</sub>	38.3 <sub>0.8</sub>	45.23 <sub>.30</sub>	14.0 <sub>1.6</sub>	40.30 <sub>.30</sub>	28.7 <sub>1.5</sub>	48.44 <sub>.36</sub>	44.2 <sub>2.0</sub>	57.41 <sub>0.90</sub>	3.9 <sub>1.7</sub>
20.7	8.72 <sub>.32</sub>	37.5 <sub>0.7</sub>	45.53 <sub>.28</sub>	15.6 <sub>1.8</sub>	40.60 <sub>.28</sub>	27.2 <sub>1.6</sub>	48.80 <sub>.34</sub>	46.2 <sub>2.4</sub>	58.31 <sub>0.79</sub>	5.6 <sub>2.2</sub>
30.7	9.04 <sub>.31</sub>	36.8 <sub>0.5</sub>	45.81 <sub>.26</sub>	17.4 <sub>2.0</sub>	40.88 <sub>.27</sub>	25.6 <sub>1.7</sub>	49.14 <sub>.30</sub>	48.6 <sub>2.8</sub>	59.10 <sub>0.68</sub>	7.8 <sub>2.6</sub>
June 9.6	9.35 <sub>.27</sub>	36.3 <sub>0.3</sub>	46.07 <sub>.23</sub>	19.4 <sub>2.0</sub>	41.15 <sub>.25</sub>	23.9 <sub>1.6</sub>	49.44 <sub>.26</sub>	51.4 <sub>3.0</sub>	59.78 <sub>0.54</sub>	10.4 <sub>3.0</sub>
19.6	9.62 <sub>.24</sub>	36.0 <sub>0.2</sub>	46.30 <sub>.20</sub>	21.4 <sub>1.9</sub>	41.40 <sub>.21</sub>	22.3 <sub>1.6</sub>	49.70 <sub>.22</sub>	54.4 <sub>3.2</sub>	60.32 <sub>0.39</sub>	13.4 <sub>3.3</sub>
29.6	9.86 <sub>.20</sub>	35.8 <sub>0.0</sub>	46.50 <sub>.17</sub>	23.3 <sub>1.9</sub>	41.61 <sub>.18</sub>	20.7 <sub>1.5</sub>	49.92 <sub>.16</sub>	57.6 <sub>3.3</sub>	60.71 <sub>0.23</sub>	16.7 <sub>3.4</sub>
July 9.5	10.06 <sub>.16</sub>	35.8 <sub>0.2</sub>	46.67 <sub>.12</sub>	25.2 <sub>1.8</sub>	41.79 <sub>.14</sub>	19.2 <sub>1.4</sub>	50.08 <sub>.11</sub>	60.9 <sub>3.3</sub>	60.94 <sub>0.06</sub>	20.1 <sub>3.5</sub>
19.5	10.22 <sub>.11</sub>	36.0 <sub>0.4</sub>	46.79 <sub>.08</sub>	27.0 <sub>1.7</sub>	41.93 <sub>.09</sub>	17.8 <sub>1.3</sub>	50.19 <sub>.04</sub>	64.2 <sub>3.3</sub>	61.00 <sub>0.12</sub>	23.6 <sub>3.6</sub>
29.5	10.33 <sub>.05</sub>	36.4 <sub>0.4</sub>	46.87 <sub>.04</sub>	28.7 <sub>1.5</sub>	42.02 <sub>.05</sub>	16.5 <sub>1.0</sub>	50.23 <sub>.01</sub>	67.5 <sub>3.1</sub>	60.88 <sub>0.27</sub>	27.2 <sub>3.4</sub>
Aug. 8.5	10.38 <sub>.01</sub>	36.8 <sub>0.6</sub>	46.91 <sub>.01</sub>	30.2 <sub>1.3</sub>	42.07 <sub>.01</sub>	15.5 <sub>0.9</sub>	50.22 <sub>.07</sub>	70.6 <sub>3.0</sub>	60.61 <sub>0.44</sub>	30.6 <sub>3.3</sub>
18.4	10.39 <sub>.05</sub>	37.4 <sub>0.7</sub>	46.90 <sub>.05</sub>	31.5 <sub>1.1</sub>	42.08 <sub>.04</sub>	14.6 <sub>0.7</sub>	50.15 <sub>.12</sub>	73.6 <sub>2.6</sub>	60.17 <sub>0.59</sub>	33.9 <sub>3.1</sub>
28.4	10.34 <sub>.08</sub>	38.1 <sub>0.7</sub>	46.85 <sub>.08</sub>	32.6 <sub>0.8</sub>	42.04 <sub>.07</sub>	13.9 <sub>0.5</sub>	50.03 <sub>.17</sub>	76.2 <sub>2.4</sub>	59.58 <sub>0.72</sub>	37.0 <sub>2.8</sub>
Sept. 7.4	10.26 <sub>.12</sub>	38.8 <sub>0.7</sub>	46.77 <sub>.12</sub>	33.4 <sub>0.6</sub>	41.97 <sub>.11</sub>	13.4 <sub>0.3</sub>	49.86 <sub>.21</sub>	78.6 <sub>2.0</sub>	58.86 <sub>0.84</sub>	39.8 <sub>2.5</sub>
17.4	10.14 <sub>.15</sub>	39.5 <sub>0.7</sub>	46.65 <sub>.14</sub>	34.0 <sub>0.4</sub>	41.86 <sub>.14</sub>	13.1 <sub>0.2</sub>	49.65 <sub>.24</sub>	80.6 <sub>1.6</sub>	58.02 <sub>0.94</sub>	42.3 <sub>2.1</sub>
27.3	9.99 <sub>.17</sub>	40.2 <sub>0.6</sub>	46.51 <sub>.16</sub>	34.4 <sub>0.2</sub>	41.72 <sub>.14</sub>	12.9 <sub>0.0</sub>	49.41 <sub>.27</sub>	82.2 <sub>1.1</sub>	57.08 <sub>1.02</sub>	44.4 <sub>1.6</sub>
Oct. 7.3	9.82 <sub>.18</sub>	40.8 <sub>0.5</sub>	46.35 <sub>.16</sub>	34.6 <sub>0.1</sub>	41.58 <sub>.16</sub>	12.9 <sub>0.2</sub>	49.14 <sub>.28</sub>	83.3 <sub>0.6</sub>	56.06 <sub>1.06</sub>	46.0 <sub>1.1</sub>
17.3	9.64 <sub>.17</sub>	41.3 <sub>0.3</sub>	46.19 <sub>.16</sub>	34.5 <sub>0.3</sub>	41.42 <sub>.15</sub>	13.1 <sub>0.3</sub>	48.86 <sub>.29</sub>	83.9 <sub>0.2</sub>	55.00 <sub>1.10</sub>	47.1 <sub>0.6</sub>
27.2	9.47 <sub>.16</sub>	41.6 <sub>0.2</sub>	46.03 <sub>.15</sub>	34.2 <sub>0.6</sub>	41.27 <sub>.15</sub>	13.4 <sub>0.5</sub>	48.57 <sub>.27</sub>	84.1 <sub>0.4</sub>	53.90 <sub>1.09</sub>	47.7 <sub>0.0</sub>
Nov. 6.2	9.31 <sub>.13</sub>	41.8 <sub>0.0</sub>	45.88 <sub>.13</sub>	33.6 <sub>0.7</sub>	41.12 <sub>.12</sub>	13.9 <sub>0.6</sub>	48.30 <sub>.26</sub>	83.7 <sub>0.9</sub>	52.81 <sub>1.05</sub>	47.7 <sub>0.6</sub>
16.2	9.18 <sub>.10</sub>	41.8 <sub>0.0</sub>	45.75 <sub>.10</sub>	32.9 <sub>1.0</sub>	41.00 <sub>.10</sub>	14.5 <sub>0.8</sub>	48.04 <sub>.23</sub>	82.8 <sub>1.3</sub>	51.76 <sub>1.00</sub>	47.1 <sub>1.1</sub>
26.2	9.08 <sub>.07</sub>	41.8 <sub>0.2</sub>	45.65 <sub>.07</sub>	31.9 <sub>1.2</sub>	40.90 <sub>.07</sub>	15.3 <sub>0.8</sub>	47.81 <sub>.20</sub>	81.5 <sub>1.9</sub>	50.76 <sub>0.91</sub>	46.0 <sub>1.7</sub>
Dec. 6.1	9.01 <sub>.03</sub>	41.6 <sub>0.3</sub>	45.58 <sub>.04</sub>	30.7 <sub>1.3</sub>	40.83 <sub>.03</sub>	16.1 <sub>1.0</sub>	47.61 <sub>.15</sub>	79.6 <sub>2.2</sub>	49.85 <sub>0.79</sub>	44.3 <sub>2.1</sub>
16.1	8.98 <sub>.02</sub>	41.3 <sub>0.4</sub>	45.54 <sub>.00</sub>	29.4 <sub>1.4</sub>	40.80 <sub>.00</sub>	17.1 <sub>1.0</sub>	47.46 <sub>.11</sub>	77.4 <sub>2.7</sub>	49.06 <sub>0.66</sub>	42.2 <sub>2.7</sub>
26.1	9.00 <sub>.06</sub>	40.9 <sub>0.5</sub>	45.54 <sub>.03</sub>	28.0 <sub>1.5</sub>	40.80 <sub>.03</sub>	18.1 <sub>1.1</sub>	47.35 <sub>.05</sub>	74.7 <sub>2.9</sub>	48.40 <sub>0.49</sub>	39.5 <sub>3.0</sub>
36.1	9.06	40.4	45.57	26.5	40.83	19.2	47.30	71.8	47.91	36.5

**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

Mean Solar Date.	$\alpha^2$ Capricorni.			$\alpha$ Pavonis.			$\gamma$ Cygni.			$\pi$ Capricorni.			$\epsilon$ Delphini.		
	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.
	h m	s	°	h m	s	°	h m	s	°	h m	s	°	h m	s	°
	20 13		-12 49	20 18		-57 1	20 18		+39 57	20 22		-18 30	20 28		+10 59
	s	"	"	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 1.1	1.48		37.0	28.49		41.3	57.52		63.7	7.98		36.4	52.70		42.7
11.0	1.54	.06	37.4	28.55	.06	39.1	57.51	.01	60.8	8.04	.06	36.4	52.73	.03	41.0
21.0	1.64	.10	37.7	28.68	.13	36.8	57.54	.03	57.9	8.13	.09	36.3	52.79	.06	39.3
31.0	1.77	.13	38.0	28.87	.19	34.4	57.62	.08	55.0	8.25	.12	36.2	52.88	.09	37.7
Feb. 10.0	1.93	.16	38.1	29.13	.26	32.0	57.74	.12	52.2	8.41	.16	36.0	53.00	.12	36.2
	1.93	.19	38.1	29.13	.31	32.0	57.74	.17	52.2	8.41	.19	36.0	53.00	.16	36.2
19.9	2.12		38.1	29.44		29.7	57.91		49.6	8.60		35.6	53.16		34.9
Mar. 1.9	2.34	.22	38.0	29.80	.36	27.5	58.12	.21	47.3	8.81	.21	35.1	53.35	.19	33.9
11.9	2.58	.24	37.6	30.20	.40	25.4	58.37	.25	45.5	9.05	.24	34.5	53.56	.21	33.2
21.9	2.84	.26	37.1	30.64	.44	23.4	58.65	.28	44.2	9.32	.27	33.7	53.80	.24	32.8
31.8	3.12	.28	36.4	31.12	.48	21.7	58.96	.31	43.4	9.60	.28	32.8	54.07	.27	32.8
	3.12	.30	36.4	31.12	.50	21.7	58.96	.33	43.4	9.60	.30	32.8	54.07	.28	32.8
Apr. 10.8	3.42		35.5	31.62		20.2	59.29		43.2	9.90		31.8	54.35		33.2
20.8	3.73	.31	34.5	32.14	.52	19.0	59.64	.35	43.5	10.22	.32	30.7	54.64	.29	34.0
30.7	4.04	.31	33.3	32.67	.53	18.1	59.99	.35	44.5	10.54	.32	29.5	54.94	.30	35.1
May 10.7	4.36	.32	32.1	33.20	.53	17.6	60.34	.35	45.9	10.87	.33	28.2	55.25	.31	36.6
20.7	4.67	.31	30.8	33.72	.52	17.4	60.68	.34	47.8	11.20	.33	27.0	55.55	.30	38.3
	4.67	.30	30.8	33.72	.50	17.4	60.68	.32	47.8	11.20	.31	27.0	55.55	.29	38.3
30.7	4.97		29.5	34.22		17.5	61.00		50.2	11.51		25.9	55.84		40.2
June 9.6	5.26	.29	28.3	34.70	.48	18.0	61.29	.29	52.8	11.81	.30	24.8	56.12	.28	42.3
19.6	5.52	.26	27.1	35.13	.43	18.8	61.55	.26	55.7	12.08	.27	23.9	56.37	.25	44.4
29.6	5.75	.23	26.1	35.51	.38	20.0	61.77	.22	58.8	12.33	.25	23.1	56.60	.23	46.6
July 9.6	5.94	.19	25.2	35.83	.32	21.4	61.94	.17	62.0	12.54	.21	22.4	56.79	.19	48.8
	5.94	.16	25.2	35.83	.25	21.4	61.94	.12	62.0	12.54	.17	22.4	56.79	.14	48.8
19.5	6.10		24.4	36.08		23.1	62.06		65.2	12.71		22.0	56.93		50.9
29.5	6.21	.11	23.8	36.25	.17	24.9	62.13	.07	68.3	12.83	.12	21.7	57.04	.11	52.8
Aug. 8.5	6.27	.06	23.4	36.35	.10	26.9	62.15	.02	71.3	12.90	.07	21.6	57.10	.06	54.6
18.4	6.29	.02	23.2	36.37	.02	29.0	62.11	.04	74.1	12.93	.03	21.7	57.12	.02	56.2
28.4	6.26	.03	23.1	36.31	.06	31.0	62.02	.09	76.6	12.91	.02	21.9	57.09	.03	57.6
	6.26	.07	23.1	36.31	.13	31.0	62.02	.13	76.6	12.91	.06	21.9	57.09	.07	57.6
Sept. 7.4	6.19		23.1	36.18		33.0	61.89		78.8	12.85		22.2	57.02		58.7
17.4	6.09	.10	23.3	35.98	.20	34.7	61.71	.18	80.7	12.75	.10	22.6	56.92	.10	59.6
27.3	5.96	.13	23.5	35.74	.24	36.2	61.51	.20	82.2	12.63	.12	23.0	56.79	.13	60.2
Oct. 7.3	5.81	.15	23.8	35.45	.29	37.4	61.28	.23	83.3	12.48	.15	23.5	56.65	.14	60.6
17.3	5.66	.15	24.2	35.15	.30	38.2	61.04	.24	83.9	12.33	.15	24.0	56.49	.16	60.7
	5.66	.16	24.2	35.15	.31	38.2	61.04	.24	83.9	12.33	.16	24.0	56.49	.16	60.7
27.3	5.50		24.6	34.84		38.6	60.80		84.1	12.17		24.4	56.33		60.5
Nov. 6.2	5.36	.14	25.0	34.54	.30	38.6	60.56	.24	83.8	12.02	.15	24.8	56.18	.15	60.1
16.2	5.24	.12	25.4	34.27	.27	38.2	60.34	.22	83.0	11.89	.13	25.1	56.04	.14	59.4
26.2	5.14	.10	25.9	34.04	.23	37.3	60.15	.19	81.7	11.78	.11	25.4	55.92	.12	58.5
Dec. 6.1	5.07	.07	26.3	33.87	.17	36.1	59.98	.17	80.0	11.71	.07	25.7	55.83	.09	57.4
	5.07	.04	26.3	33.87	.11	36.1	59.98	.13	80.0	11.71	.04	25.7	55.83	.07	57.4
16.1	5.03		26.7	33.76		34.5	59.85		77.9	11.67		25.9	55.76		56.0
26.1	5.03	.00	27.1	33.71	.05	32.6	59.77	.08	75.4	11.66	.01	26.0	55.73	.03	54.5
36.1	5.07	.04	27.5	33.73	.02	30.5	59.73	.04	72.7	11.69	.03	26.0	55.74	.01	53.0

## FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	Groombridge 3241.		$\alpha$ Delphini.		$\beta$ Pavonis.		$\alpha$ Cygni.		$\psi$ Capricorni.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 20 30	° ' " +72 13	h m 20 35	° ' " +15 35	h m 20 36	° ' " -66 31	h m 20 38	° ' " +44 57	h m 20 40	° ' " -25 35
Jan. 1.1	19.90	38.9	25.38	34.3	47.29	54.9	19.38	29.7	43.86	53.0
11.1	19.61	35.8	25.39	32.4	47.29	52.3	19.33	26.8	43.89	52.6
21.0	19.44	32.5	25.44	30.5	47.39	49.5	19.33	23.9	43.97	52.1
31.0	19.41	29.0	25.52	28.7	47.58	46.6	19.37	20.9	44.08	51.5
Feb. 10.0	19.51	25.6	25.64	27.0	47.86	43.7	19.47	17.9	44.22	50.7
19.9	19.75	22.4	25.79	25.4	48.22	40.9	19.62	15.1	44.40	49.8
Mar. 1.9	20.10	19.4	25.97	24.2	48.65	38.2	19.82	12.6	44.61	48.9
11.9	20.57	16.8	26.18	23.3	49.15	35.6	20.06	10.6	44.85	47.8
21.9	21.13	14.8	26.42	22.7	49.70	33.3	20.34	9.0	45.11	46.7
31.8	21.77	13.3	26.68	22.6	50.30	31.2	20.66	7.9	45.40	45.5
Apr. 10.8	22.47	12.4	26.96	22.8	50.95	29.4	21.00	7.4	45.70	44.2
20.8	23.20	12.1	27.25	23.5	51.62	28.0	21.36	7.5	46.03	42.9
30.8	23.94	12.5	27.56	24.6	52.31	27.0	21.73	8.2	46.37	41.6
May 10.7	24.67	13.5	27.87	26.0	53.01	26.3	22.10	9.5	46.71	40.3
20.7	25.36	15.1	28.17	27.8	53.70	26.0	22.47	11.3	47.05	39.1
30.7	25.99	17.2	28.47	29.8	54.37	26.2	22.82	13.5	47.39	38.0
June 9.6	26.55	19.7	28.75	32.0	55.00	26.8	23.14	16.1	47.71	37.1
19.6	27.02	22.7	29.01	34.3	55.58	27.8	23.43	19.0	48.01	36.4
29.6	27.38	25.9	29.24	36.7	56.09	29.2	23.68	22.1	48.29	35.8
July 9.6	27.63	29.4	29.43	39.0	56.53	30.9	23.87	25.4	48.52	35.5
19.5	27.77	32.9	29.58	41.3	56.88	32.9	24.02	28.7	48.72	35.3
29.5	27.78	36.5	29.69	43.5	57.13	35.1	24.11	32.0	48.86	35.4
Aug. 8.5	27.67	40.1	29.75	45.6	57.28	37.5	24.14	35.2	48.96	35.7
18.5	27.44	43.5	29.77	47.4	57.32	39.9	24.11	38.3	49.01	36.2
28.4	27.10	46.8	29.74	49.0	57.26	42.4	24.03	41.1	49.01	36.8
Sept. 7.4	26.66	49.8	29.67	50.4	57.10	44.7	23.90	43.6	48.96	37.5
17.4	26.13	52.4	29.57	51.5	56.85	46.8	23.72	45.8	48.87	38.2
27.3	25.52	54.7	29.45	52.3	56.52	48.6	23.51	47.6	48.75	38.9
Oct. 7.3	24.85	56.5	29.30	52.9	56.14	50.1	23.27	49.0	48.61	39.7
17.3	24.13	57.8	29.14	53.1	55.71	51.1	23.02	50.0	48.45	40.3
27.3	23.39	58.6	28.97	53.0	55.27	51.7	22.75	50.4	48.29	40.9
Nov. 6.2	22.65	58.8	28.81	52.7	54.83	51.8	22.49	50.4	48.13	41.4
16.2	21.92	58.5	28.67	52.0	54.42	51.3	22.24	49.8	47.99	41.7
26.2	21.23	57.6	28.54	51.1	54.05	50.3	22.01	48.8	47.87	41.8
Dec. 6.2	20.59	56.1	28.44	49.9	53.75	48.9	21.81	47.3	47.78	41.9
16.1	20.03	54.1	28.36	48.5	53.52	47.1	21.64	45.3	47.72	41.8
26.1	19.56	51.6	28.32	46.8	53.38	44.9	21.51	43.0	47.69	41.5
36.1	19.20	48.8	28.32	45.0	53.33	42.4	21.43	40.3	47.71	41.2

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Cygni.		μ Aquarii.		12 Year Cat. 1879.		ν Cygni.		61 <sup>r</sup> Cygni.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 20 42	° +33 37	h m 20 47	° - 9 19	h m 20 51	° +80 12	h m 20 53	° +40 48	h m 21 2	° +38 18
	s "	"	s "	"	s "	"	s "	"	s "	"
Jan. 1.1	31.96 .02	55.9 2.5	45.93 .03	27.5 0.5	35.29 0.72	59.3 2.8	46.75 .06	72.5 2.6	49.44 .04	22.5 2.4
11.1	31.94 .02	53.4 2.6	45.96 .05	28.0 0.5	34.57 0.50	56.5 3.2	46.69 .01	69.9 2.8	49.40 .01	20.1 2.6
21.1	31.96 .05	50.8 2.7	46.01 .09	28.5 0.4	34.07 0.26	53.3 3.3	46.68 .03	67.1 2.9	49.39 .04	17.5 2.6
31.0	32.01 .10	48.1 2.5	46.10 .13	28.9 0.2	33.81 0.01	50.0 3.4	46.71 .08	64.2 2.8	49.43 .08	14.9 2.6
Feb. 10.0	32.11 .14	45.6 2.4	46.23 .15	29.1 0.1	33.80 0.23	46.6 3.3	46.79 .13	61.4 2.6	49.51 .12	12.3 2.5
20.0	32.25 .18	43.2 2.0	46.38 .18	29.2 0.1	34.03 0.47	43.3 3.1	46.92 .17	58.8 2.4	49.63 .17	9.8 2.2
Mar. 1.9	32.43 .22	41.2 1.7	46.56 .21	29.1 0.3	34.50 0.69	40.2 2.7	47.09 .22	56.4 2.0	49.80 .21	7.6 1.9
11.9	32.65 .25	39.5 1.3	46.77 .23	28.8 0.5	35.19 0.88	37.5 2.4	47.31 .25	54.4 1.6	50.01 .25	5.7 1.4
21.9	32.90 .28	38.2 0.7	47.00 .26	28.3 0.8	36.07 1.03	35.1 1.8	47.56 .29	52.8 1.0	50.26 .29	4.3 0.9
31.9	33.18 .30	37.5 0.2	47.26 .28	27.5 0.9	37.10 1.15	33.3 1.2	47.85 .32	51.8 0.5	50.55 .31	3.4 0.4
Apr. 10.8	33.48 .33	37.3 0.3	47.54 .29	26.6 1.1	38.25 1.22	32.1 0.7	48.17 .34	51.3 0.1	50.86 .34	3.0 0.1
20.8	33.81 .33	37.6 0.5	47.83 .31	25.5 1.3	39.47 1.26	31.4 0.0	48.51 .35	51.4 0.6	51.20 .35	3.1 0.7
30.8	34.14 .34	38.1 1.7	48.14 .32	24.2 1.4	40.73 1.25	31.4 0.6	48.86 .36	52.0 1.2	51.55 .36	3.8 1.3
May 10.7	34.48 .33	39.8 1.8	48.46 .31	22.8 1.5	41.98 1.20	32.0 1.2	49.22 .36	53.2 1.7	51.91 .36	5.1 1.7
20.7	34.81 .32	41.6 2.1	48.77 .31	21.3 1.6	43.18 1.11	33.2 1.8	49.58 .34	54.9 2.1	52.27 .35	6.8 2.1
30.7	35.13 .30	43.7 2.5	49.08 .30	19.7 1.5	44.29 0.99	35.0 2.3	49.92 .32	57.0 2.5	52.62 .33	8.9 2.6
June 9.7	35.43 .27	46.2 2.8	49.38 .28	18.2 1.5	45.28 0.83	37.3 2.7	50.24 .29	59.5 2.8	52.95 .31	11.5 2.8
19.6	35.70 .24	49.0 2.9	49.66 .25	16.7 1.3	46.11 0.66	40.0 3.0	50.53 .26	62.3 3.0	53.26 .27	14.3 3.0
29.6	35.94 .20	51.9 3.0	49.91 .22	15.4 1.2	46.77 0.47	43.0 3.3	50.79 .21	65.3 3.1	53.53 .23	17.3 3.2
July 9.6	36.14 .15	54.9 3.0	50.13 .18	14.2 1.1	47.24 0.27	46.3 3.5	51.00 .17	68.4 3.3	53.76 .18	20.5 3.2
19.6	36.29 .10	57.9 3.0	50.31 .14	13.1 0.9	47.51 0.06	49.8 3.5	51.17 .11	71.7 3.2	53.94 .14	23.7 3.3
29.5	36.39 .06	60.9 2.8	50.45 .09	12.2 0.7	47.57 0.16	53.3 3.6	51.28 .06	74.9 3.1	54.08 .08	27.0 3.1
Aug. 8.5	36.45 .00	63.7 2.7	50.54 .05	11.5 0.5	47.41 0.36	56.9 3.6	51.34 .00	78.0 3.0	54.16 .03	30.1 3.1
18.5	36.45 .04	66.4 2.5	50.59 .00	11.0 0.3	47.05 0.56	60.5 3.4	51.34 .05	81.0 2.7	54.19 .03	33.2 2.8
28.5	36.41 .09	68.9 2.2	50.59 .04	10.7 0.2	46.49 0.74	63.9 3.2	51.29 .10	83.7 2.5	54.16 .07	36.0 2.5
Sept. 7.4	36.32 .13	71.1 1.8	50.55 .07	10.5 0.0	45.75 0.91	67.1 2.9	51.19 .14	86.2 2.2	54.09 .11	38.5 2.3
17.4	36.19 .16	72.9 1.5	50.48 .10	10.5 0.1	44.84 1.06	70.0 2.6	51.05 .17	88.4 1.9	53.98 .15	40.8 1.9
27.4	36.03 .19	74.4 1.2	50.38 .13	10.6 0.3	43.78 1.18	72.6 2.2	50.88 .21	90.3 1.4	53.83 .17	42.7 1.5
Oct. 7.3	35.84 .20	75.6 0.7	50.25 .14	10.9 0.3	42.60 1.28	74.8 1.8	50.67 .22	91.7 1.0	53.66 .20	44.2 1.1
17.3	35.64 .21	76.3 0.3	50.11 .15	11.2 0.4	41.32 1.35	76.6 1.2	50.45 .24	92.7 0.6	53.46 .21	45.3 0.7
27.3	35.43 .20	76.6 0.1	49.96 .15	11.6 0.5	39.97 1.39	77.8 0.7	50.21 .23	93.3 0.1	53.25 .21	46.0 0.2
Nov. 6.3	35.23 .19	76.5 0.6	49.81 .13	12.1 0.5	38.58 1.38	78.5 0.2	49.98 .23	93.4 0.4	53.04 .20	46.2 0.2
16.2	35.04 .18	75.9 1.0	49.68 .11	12.6 0.5	37.20 1.35	78.7 0.5	49.75 .21	93.0 0.9	52.84 .19	46.0 0.7
26.2	34.86 .15	74.9 1.4	49.57 .09	13.1 0.6	35.85 1.28	78.2 1.0	49.54 .18	92.1 1.4	52.65 .17	45.3 1.1
Dec. 6.2	34.71 .12	73.5 1.7	49.48 .05	13.7 0.6	34.57 1.16	77.2 1.6	49.36 .16	90.7 1.7	52.48 .14	44.2 1.6
16.1	34.59 .08	71.8 2.1	49.43 .03	14.3 0.5	33.41 1.02	75.6 2.1	49.20 .12	89.0 2.2	52.34 .10	42.6 1.9
26.1	34.51 .05	69.7 2.4	49.40 .01	14.8 0.5	32.39 0.84	73.5 2.6	49.08 .08	86.8 2.4	52.24 .07	40.7 2.3
36.1	34.46	67.3	49.41	15.3	31.55	70.9	49.00	84.4	52.17	38.4

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Cygni.			τ Cygni.			α Cephei.			ι Pegasi.			ζ Capricorni.		
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	21 9		+29 51	21 11		+37 39	21 16		+62 11	21 17		+19 24	21 21		-22 47
Jan. 1.1	4.21		24.5	9.69		38.9	22.98		78.5	53.45		64.7	29.81		79.0
11.1	4.17	.04	22.3 2.2	9.62	.07	36.5 2.4	22.76	.22	75.8 2.7	53.42	.01	62.9 1.8	29.80	.01	78.7 0.3
21.1	4.17	.00	20.0 2.3	9.60	.02	33.9 2.6	22.62	.14	72.8 3.0	53.43	.03	61.0 1.9	29.83	.03	78.3 0.4
31.0	4.20	.03	17.6 2.4	9.62	.02	31.2 2.7	22.55	.07	69.6 3.2	53.46	.03	59.1 1.9	29.89	.06	77.8 0.5
Feb. 10.0	4.27	.07	15.2 2.4	9.68	.06	28.6 2.6	22.56	.01	66.3 3.3	53.53	.07	57.3 1.8	29.99	.10	77.1 0.7
		.11	12.2 2.2		.11	25.5 2.5		.09			.11	54.3 1.6		.13	76.2 0.9
20.0	4.38		13.0	9.79		26.1	22.65		63.1	53.64		55.7	30.12		76.2
Mar. 2.0	4.53	.15	11.1 1.9	9.94	.15	23.8 2.3	22.82	.17	60.1 3.0	53.78	.14	54.2 1.5	30.28	.16	75.2 1.0
11.9	4.72	.19	9.5 1.6	10.13	.19	21.9 1.9	23.08	.26	57.4 2.7	53.95	.17	53.1 1.1	30.48	.20	74.1 1.1
21.9	4.94	.25	8.3 1.2	10.36	.23	20.4 1.5	23.41	.33	55.2 2.2	54.16	.21	52.3 0.8	30.70	.22	72.8 1.3
31.9	5.19	.28	7.5 0.3	10.63	.27	19.3 0.5	23.80	.39	53.4 1.8	54.39	.23	51.9 0.4	30.95	.25	71.4 1.4
					.30			.44			.26	51.9 0.1		.28	71.4 1.5
Apr. 10.8	5.47	.30	7.2	10.93	.32	18.8	24.24	.48	52.2	54.65	.29	52.0	31.23	.30	69.9
20.8	5.77	.32	7.4 0.2	11.25	.34	18.8 0.6	24.72	.51	51.6 0.6	54.94	.30	52.5 0.5	31.53	.32	68.4 1.5
30.8	6.09	.33	8.2 0.8	11.59	.35	19.4 1.1	25.23	.52	51.6 0.6	55.24	.31	53.4 0.9	31.85	.33	68.4 1.6
May 10.8	6.42	.33	9.4 1.2	11.94	.35	20.5 1.6	25.75	.52	52.2 1.2	55.55	.32	54.7 1.3	32.18	.33	66.8 1.6
20.7	6.75	.33	11.0 1.6	12.29	.34	22.1 2.0	26.27	.50	53.4 1.8	55.87	.32	56.3 1.6	32.52	.34	65.2 1.5
												56.3 1.9			63.7 1.5
30.7	7.08	.31	13.1	12.63	.33	24.1	26.77	.46	55.2	56.19	.29	58.2	32.86		62.2
June 9.7	7.39	.29	15.4 2.3	12.96	.30	26.5 2.4	27.23	.42	57.5 2.3	56.49	.28	60.4 2.2	33.19	.33	62.2 1.3
19.7	7.68	.26	18.0 2.6	13.26	.27	29.2 2.9	27.65	.37	60.2 2.7	56.77	.26	62.8 2.4	33.51	.32	60.9 1.1
29.6	7.94	.22	20.7 2.7	13.53	.23	32.1 3.1	28.02	.30	63.2 3.0	57.03	.23	65.3 2.5	33.80	.29	59.8 1.0
July 9.6	8.16	.18	23.6 2.9	13.76	.18	35.2 3.2	28.32	.22	66.5 3.5	57.26	.19	67.8 2.6	34.06	.26	58.8 0.7
														.23	58.1 0.5
19.6	8.34	.13	26.5 2.9	13.94	.14	38.4	28.54	.15	70.0 3.6	57.45	.15	70.4	34.29	.18	57.6
29.5	8.47	.09	29.4 2.7	14.08	.08	41.5 3.1	28.69	.06	73.6 3.6	57.60	.10	72.8 2.4	34.47	.14	57.4 0.2
Aug. 8.5	8.56	.04	32.1 2.6	14.16	.03	44.6 2.9	28.75	.01	77.2 3.6	57.70	.06	75.2 2.1	34.61	.09	57.4 0.0
18.5	8.60	.01	34.7 2.4	14.19	.02	47.5 2.8	28.74	.10	80.8 3.4	57.76	.01	77.3 2.0	34.70	.04	57.4 0.3
28.5	8.59	.06	37.1 2.2	14.17	.07	50.3 2.5	28.64	.17	84.2 3.3	57.77	.03	79.3 1.7	34.74	.01	57.7 0.4
															58.1 0.5
Sept. 7.4	8.53	.09	39.3	14.10	.11	52.8	28.47	.24	87.5	57.74	.07	81.0	34.73	.05	58.6
17.4	8.44	.13	41.2 1.6	13.99	.15	55.0 2.2	28.23	.30	90.4 2.9	57.67	.10	82.5 1.5	34.68	.08	59.3 0.7
27.4	8.31	.15	42.8 1.2	13.84	.17	56.9 1.5	27.93	.34	93.1 2.2	57.57	.13	83.7 0.9	34.60	.12	59.3 0.7
Oct. 7.4	8.16	.18	44.0 0.8	13.67	.20	58.4 1.1	27.59	.39	95.3 1.8	57.44	.14	84.6 0.5	34.48	.13	60.0 0.8
17.3	7.98	.18	44.8 0.5	13.47	.21	59.5 0.7	27.20	.41	97.1 1.3	57.30	.16	85.1 0.3	34.35	.15	60.8 0.8
															61.6 0.7
27.3	7.80	.19	45.3	13.26	.21	60.2	26.79	.43	98.4 0.8	57.14	.16	85.4 0.1	34.20	.15	62.3
Nov. 6.3	7.61	.18	45.3 0.3	13.05	.21	60.4 0.2	26.36	.43	99.2 0.2	56.98	.15	85.3 0.4	34.05	.14	62.3 0.7
16.2	7.43	.17	45.0 0.8	12.84	.19	60.2 0.7	25.93	.42	99.4 0.4	56.83	.14	84.9 0.7	33.91	.13	63.0 0.5
26.2	7.26	.14	44.2 1.1	12.65	.18	59.5 1.2	25.51	.40	99.0 0.9	56.69	.12	84.2 1.0	33.78	.11	63.5 0.4
Dec. 6.2	7.12	.13	43.1 1.5	12.47	.15	58.3 1.5	25.11	.36	98.1 1.5	56.57	.10	83.2 1.3	33.67	.08	63.9 0.2
															64.1 0.1
16.2	6.99	.09	41.6 1.8	12.32	.12	56.8	24.75	.31	96.6 2.0	56.47	.08	81.9 1.5	33.59	.06	64.2
26.1	6.90	.06	39.8 2.1	12.20	.09	54.9 2.3	24.44	.26	94.6 2.5	56.39	.04	80.4 1.6	33.53	.02	64.2 0.0
36.1	6.84		37.7	12.11		52.6	24.18		92.1	56.35		78.8	33.51		64.0 0.2



# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\beta$ Aquarii.		$\beta$ Cephei ( <i>pr.</i> ).		$\xi$ Aquarii.		74 Cygni.		$\lambda$ Octantis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 21 26	° ' " — 5 57	h m 21 27	° ' " + 70 9	h m 21 32	° ' " — 8 15	h m 21 33	° ' " + 40 0	h m 21 37	° ' " — 83 7
	s	"	s	"	s	"	s	"	s	"
Jan. 1.1	47.38 .01	72.9 0.6	26.54 .37	61.4 2.6	55.79 .01	39.9 0.5	18.31 .09	33.0 2.3	3.23 0.69	82.3 3.0
11.1	47.37 .02	73.5 0.6	26.17 .28	58.8 2.9	55.78 .01	40.4 0.4	18.22 .05	30.7 2.6	2.54 0.41	79.3 3.3
21.1	47.39 .05	74.1 0.5	25.89 .17	55.9 3.2	55.79 .05	40.8 0.3	18.17 .01	28.1 2.6	2.13 0.10	76.0 3.5
31.0	47.44 .08	74.6 0.3	25.72 .06	52.7 3.3	55.84 .07	41.1 0.2	18.16 .03	25.5 2.7	2.03 0.21	72.5 3.6
Feb. 10.0	47.52 .11	74.9 0.2	25.66 .06	49.4 3.3	55.91 .11	41.3 0.1	18.19 .08	22.8 2.6	2.24 0.50	68.9 3.6
20.0	47.63 .14	75.1 0.0	25.72 .18	46.1 3.2	56.02 .13	41.4 0.2	18.27 .12	20.2 2.4	2.74 0.78	65.3 3.6
Mar. 2.0	47.77 .17	75.1 0.2	25.90 .29	42.9 2.9	56.15 .17	41.2 0.4	18.39 .17	17.8 2.1	3.52 1.05	61.7 3.5
11.9	47.94 .20	74.9 0.5	26.19 .40	40.0 2.5	56.32 .20	40.8 0.6	18.56 .21	15.7 1.7	4.57 1.29	58.2 3.2
21.9	48.14 .23	74.4 0.7	26.59 .49	37.5 2.0	56.52 .22	40.2 0.8	18.77 .25	14.0 1.3	5.86 1.51	55.0 3.0
31.9	48.37 .25	73.7 0.9	27.08 .56	35.5 1.5	56.74 .25	39.4 1.1	19.02 .29	12.7 0.7	7.37 1.69	52.0 2.6
Apr. 10.9	48.62 .28	72.8 1.2	27.64 .62	34.0 0.9	56.99 .28	38.3 1.2	19.31 .32	12.0 0.2	9.06 1.83	49.4 2.2
20.8	48.90 .29	71.6 1.4	28.26 .66	33.1 0.3	57.27 .30	37.1 1.4	19.63 .34	11.8 0.3	10.89 1.95	47.2 1.8
30.8	49.19 .31	70.2 1.5	28.92 .68	32.8 0.4	57.57 .31	35.7 1.6	19.97 .36	12.1 0.9	12.84 2.02	45.4 1.3
May 10.8	49.50 .32	68.7 1.7	29.60 .68	33.2 1.0	57.88 .31	34.1 1.7	20.33 .36	13.0 1.4	14.86 2.06	44.1 0.8
20.7	49.82 .31	67.0 1.7	30.28 .65	34.2 1.5	58.19 .32	32.4 1.7	20.69 .36	14.4 1.8	16.92 2.05	43.3 0.3
30.7	50.13 .31	65.3 1.8	30.93 .61	35.7 2.0	58.51 .32	30.7 1.7	21.05 .35	16.2 2.3	18.97 2.00	43.0 0.2
June 9.7	50.44 .30	63.5 1.7	31.54 .55	37.7 2.5	58.83 .30	29.0 1.7	21.40 .32	18.5 2.6	20.97 1.19	43.2 0.8
19.7	50.74 .27	61.8 1.7	32.09 .48	40.2 3.0	59.13 .28	27.3 1.6	21.72 .29	21.1 2.8	22.86 1.74	44.0 1.2
29.6	51.01 .25	60.1 1.5	32.57 .39	43.2 3.2	59.41 .25	25.7 1.5	22.01 .26	23.9 3.1	24.60 1.55	45.2 1.7
July 9.6	51.26 .20	58.6 1.4	32.96 .29	46.4 3.5	59.66 .21	24.2 1.2	22.27 .21	27.0 3.1	26.15 1.32	46.9 2.1
19.6	51.46 .17	57.2 1.2	33.25 .19	49.9 3.6	59.87 .18	23.0 1.1	22.48 .16	30.1 3.2	27.47 1.04	49.0 2.4
29.6	51.63 .13	56.0 1.0	33.44 .08	53.5 3.7	60.05 .13	21.9 0.9	22.64 .11	33.3 3.2	28.51 0.74	51.4 2.7
Aug. 8.5	51.76 .08	55.0 0.8	33.52 .03	57.2 3.7	60.18 .09	21.0 0.7	22.75 .05	36.5 3.1	29.25 0.41	54.1 2.9
18.5	51.84 .04	54.2 0.6	33.49 .13	60.9 3.6	60.27 .05	20.3 0.5	22.80 .00	39.6 2.9	29.66 0.08	57.0 2.9
28.5	51.88 .00	53.6 0.4	33.36 .23	64.5 3.4	60.32 .00	19.8 0.2	22.80 .04	42.5 2.7	29.74 0.25	59.9 2.9
Sept. 7.4	51.88 .04	53.2 0.2	33.13 .33	67.9 3.2	60.32 .03	19.6 0.1	22.76 .09	45.2 2.4	29.49 0.58	62.8 2.8
17.4	51.84 .08	53.0 0.0	32.80 .41	71.1 2.9	60.29 .07	19.5 0.1	22.67 .13	47.6 2.1	28.91 0.88	65.6 2.5
27.4	51.76 .11	53.0 0.2	32.39 .48	74.0 2.5	60.22 .10	19.6 0.3	22.54 .17	49.7 1.8	28.03 1.15	68.1 2.2
Oct. 7.4	51.65 .12	53.2 0.2	31.91 .54	76.5 2.1	60.12 .12	19.9 0.3	22.37 .19	51.5 1.4	26.88 1.36	70.3 1.8
17.3	51.53 .13	53.4 0.4	31.37 .58	78.6 1.6	60.00 .13	20.2 0.4	22.18 .20	52.9 0.9	25.52 1.52	72.1 1.2
27.3	51.40 .14	53.8 0.5	30.79 .61	80.2 1.1	59.87 .14	20.6 0.5	21.98 .21	53.8 0.5	24.00 1.62	73.3 0.6
Nov. 6.3	51.26 .13	54.3 0.5	30.18 .63	81.3 0.5	59.73 .13	21.1 0.6	21.77 .22	54.3 0.0	22.38 1.65	73.9 0.1
16.3	51.13 .12	54.8 0.6	29.55 .62	81.8 0.1	59.60 .12	21.7 0.6	21.55 .21	54.3 0.4	20.73 1.61	74.0 0.6
26.2	51.01 .10	55.4 0.6	28.93 .59	81.7 0.6	59.48 .10	22.3 0.5	21.34 .19	53.9 0.9	19.12 1.50	73.4 1.2
Dec. 6.2	50.91 .08	56.0 0.7	28.34 .56	81.1 1.3	59.38 .08	22.8 0.6	21.15 .17	53.0 1.4	17.62 1.34	72.2 1.8
16.2	50.83 .05	56.7 0.6	27.78 .50	79.8 1.8	59.30 .06	23.4 0.6	20.98 .15	51.6 1.7	16.28 1.12	70.4 2.3
26.1	50.78 .03	57.3 0.6	27.28 .42	78.0 2.3	59.24 .03	24.0 0.5	20.83 .11	49.9 2.1	15.16 0.87	68.1 2.8
36.1	50.75	57.9	26.86	75.7	59.21	24.5	20.72	47.8	14.29	65.3

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Pegasi.		ι Cephei.		π Cygni.		μ Capricorni.		16 Pegasi.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 21 39	° + 9 27	h m 21 40	° + 70 53	h m 21 43	° + 48 53	h m 21 48	° - 13 58	h m 21 48	° + 25 29
	s	"	s	"	s	"	s	"	s	"
Jan. 1.1	44.05	37.2	32.69	55.1	25.73	37.5	21.55	45.2	56.06	63.4
	.03	1.3	.42	2.4	.14	2.3	.02	0.2	.06	1.8
11.1	44.02	35.9	32.27	52.7	25.59	35.2	21.53	45.4	56.00	61.6
	.01	1.4	.32	2.8	.10	2.7	.00	0.1	.04	2.0
21.1	44.01	34.5	31.95	49.9	25.49	32.5	21.53	45.5	55.96	59.6
	.03	1.3	.21	3.1	.05	2.8	.03	0.0	.00	2.1
31.1	44.04	33.2	31.74	46.8	25.44	29.7	21.56	45.5	55.96	57.5
	.05	1.2	.10	3.3	.00	2.9	.06	0.2	.03	2.0
Feb. 10.0	44.09	32.0	31.64	43.5	25.44	26.8	21.62	45.3	55.99	55.5
	.09	1.1	.02	3.3	.06	2.9	.10	0.4	.07	1.9
20.0	44.18	30.9	31.66	40.2	25.50	23.9	21.72	44.9	56.06	53.6
	.12	0.9	.15	3.2	.11	2.7	.12	0.6	.11	1.7
Mar. 2.0	44.30	30.0	31.81	37.0	25.61	21.2	21.84	44.3	56.17	51.9
	.15	0.6	.27	2.9	.17	2.5	.16	0.7	.14	1.5
11.9	44.45	29.4	32.08	34.1	25.78	18.7	22.00	43.6	56.31	50.4
	.19	0.3	.38	2.6	.22	2.0	.19	0.9	.18	1.1
21.9	44.64	29.1	32.46	31.5	26.00	16.7	22.19	42.7	56.49	49.3
	.22	0.0	.47	2.2	.27	1.6	.22	1.2	.22	0.7
31.9	44.86	29.1	32.93	29.3	26.27	15.1	22.41	41.5	56.71	48.6
	.24	0.4	.56	1.6	.32	1.1	.24	1.3	.25	0.3
Apr. 10.9	45.10	29.5	33.49	27.7	26.59	14.0	22.65	40.2	56.96	48.3
	.26	0.7	.63	1.1	.35	0.6	.27	1.5	.28	0.1
20.8	45.36	30.2	34.12	26.6	26.94	13.4	22.92	38.7	57.24	48.4
	.29	1.1	.67	0.4	.38	0.0	.30	1.6	.30	0.6
30.8	45.65	31.3	34.79	26.2	27.32	13.4	23.22	37.1	57.54	49.0
	.31	1.4	.70	0.1	.39	0.6	.31	1.7	.31	1.1
May 10.8	45.96	31.7	35.49	26.3	27.71	14.0	23.53	35.4	57.85	50.1
	.31	1.6	.70	0.8	.40	1.2	.32	1.7	.33	1.5
20.7	46.27	34.3	36.19	27.1	28.11	15.2	23.85	33.7	58.18	51.6
	.31	1.9	.69	1.4	.40	1.7	.33	1.7	.33	1.8
30.7	46.58	36.2	36.88	28.5	28.51	16.9	24.18	32.0	58.51	53.4
	.31	2.0	.65	1.9	.39	2.1	.32	1.7	.32	2.1
June 9.7	46.89	38.2	37.53	30.4	28.90	19.0	24.50	30.3	58.83	55.5
	.29	2.2	.59	2.4	.36	2.5	.32	1.6	.31	2.4
19.7	47.18	40.4	38.12	32.8	29.26	21.5	24.82	28.7	59.14	57.9
	.28	2.2	.52	2.8	.33	2.9	.29	1.4	.28	2.6
29.6	47.46	42.6	38.64	35.6	29.59	24.4	25.11	27.3	59.42	60.5
	.24	2.2	.43	3.2	.29	3.1	.27	1.3	.26	2.7
July 9.6	47.70	44.8	39.07	38.8	29.88	27.5	25.38	26.0	59.68	63.2
	.21	2.1	.33	3.4	.23	3.3	.24	1.0	.21	2.8
19.6	47.91	46.9	39.40	42.2	30.11	30.8	25.62	25.0	59.89	66.0
	.17	2.0	.23	3.6	.18	3.4	.20	0.8	.18	2.7
29.6	48.08	48.9	39.63	45.8	30.29	34.2	25.82	24.2	60.07	68.7
	.13	1.9	.13	3.7	.12	3.4	.15	0.6	.13	2.6
Aug. 8.5	48.21	50.8	39.76	49.5	30.41	37.6	25.97	23.6	60.20	71.3
	.09	1.7	.01	3.7	.06	3.4	.11	0.4	.09	2.6
18.5	48.30	52.5	39.77	53.2	30.47	41.0	26.08	23.2	60.29	73.9
	.04	1.5	.10	3.7	.00	3.3	.06	0.1	.04	2.3
28.5	48.34	54.0	39.67	56.9	30.47	44.3	26.14	23.1	60.33	76.2
	.00	1.3	.20	3.5	.05	3.0	.02	0.0	.01	2.1
Sept. 7.5	48.34	55.3	39.47	60.4	30.42	47.3	26.16	23.1	60.32	78.3
	.04	1.0	.30	3.3	.11	2.8	.02	0.2	.04	1.9
17.4	48.30	56.3	39.17	63.7	30.31	50.1	26.14	23.3	60.28	80.2
	.07	0.8	.39	3.0	.15	2.5	.06	0.4	.09	1.6
27.4	48.23	57.1	38.78	66.7	30.16	52.6	26.08	23.7	60.19	81.8
	.10	0.5	.47	2.7	.19	2.2	.09	0.5	.11	1.3
Oct. 7.4	48.13	57.6	38.31	69.4	29.97	54.8	25.99	24.2	60.08	83.1
	.12	0.4	.53	2.3	.22	1.7	.11	0.6	.13	1.0
17.3	48.01	58.0	37.78	71.7	29.75	56.5	25.88	24.8	59.95	84.1
	.13	0.0	.59	1.8	.25	1.3	.13	0.6	.15	0.6
27.3	47.88	58.0	37.19	73.5	29.50	57.8	25.75	25.4	59.80	84.7
	.14	0.1	.62	1.3	.26	0.8	.13	0.6	.16	0.3
Nov. 6.3	47.74	57.9	36.57	74.8	29.24	58.6	25.62	26.0	59.64	85.0
	.14	0.4	.64	0.7	.27	0.3	.13	0.6	.16	0.1
16.3	47.60	57.5	35.93	75.5	28.97	58.9	25.49	26.6	59.48	84.9
	.13	0.6	.64	0.1	.26	0.2	.12	0.6	.15	0.5
26.2	47.47	56.9	35.29	75.6	28.71	58.7	25.37	27.2	59.33	84.4
	.11	0.8	.62	0.4	.24	0.7	.11	0.5	.15	0.8
Dec. 6.2	47.36	56.1	34.67	75.2	28.47	58.0	25.26	27.7	59.18	83.6
	.09	1.0	.59	1.0	.23	1.2	.09	0.4	.12	1.1
16.2	47.27	55.1	34.08	74.2	28.24	56.8	25.17	28.1	59.06	82.5
	.07	1.2	.54	1.7	.20	1.7	.07	0.4	.11	1.5
26.2	47.20	53.9	33.54	72.5	28.04	55.1	25.10	28.5	58.95	81.0
	.05	1.2	.46	2.1	.16	2.1	.04	0.2	.08	1.6
36.1	47.15	52.7	33.08	70.4	27.88	53.0	25.06	28.7	58.87	79.4

# FIXED STARS, 1910.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	79 Draconis.		α Aquarii.		α Gruis.		π² Pegasi.		θ Aquarii.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 21 51	° ' " +73 16	h m 22 1	° ' " - 0 45	h m 22 2	° ' " -47 23	h m 22 5	° ' " +32 43	h m 22 12	° ' " - 8 13
	s	"	s	"	s	"	s	"	s	"
Jan. 1.1	40.22	42.2	7.94	35.1	31.73	70.1	57.44	71.2	3.38	64.7
11.1	39.71	39.9	7.90	35.9	31.65	68.7	57.34	69.3	3.34	65.2
21.1	39.29	37.2	7.89	36.6	31.62	67.0	57.28	67.2	3.32	65.6
31.1	39.00	34.2	7.90	37.3	31.63	65.0	57.25	64.9	3.33	65.9
Feb. 10.0	38.84	31.0	7.94	37.9	31.68	62.8	57.25	62.6	3.36	66.0
20.0	38.82	27.7	8.01	38.4	31.78	60.5	57.29	60.4	3.43	65.9
Mar. 2.0	38.94	24.5	8.11	38.6	31.93	58.0	57.38	58.3	3.52	65.7
12.0	39.20	21.5	8.25	38.6	32.12	55.4	57.51	56.5	3.65	65.2
21.9	39.58	18.8	8.42	38.3	32.35	52.9	57.68	55.0	3.81	64.5
31.9	40.09	16.5	8.62	37.8	32.63	50.3	57.89	53.9	4.01	63.6
Apr. 10.9	40.70	14.7	8.84	37.0	32.95	47.8	58.13	53.3	4.23	62.4
20.8	41.38	13.5	9.10	35.9	33.30	45.5	58.41	53.1	4.48	61.1
30.8	42.13	12.9	9.38	34.6	33.69	43.3	58.72	53.4	4.76	59.6
May 10.8	42.91	12.9	9.68	33.1	34.10	41.3	59.05	54.2	5.06	57.9
20.7	43.70	13.5	9.99	31.4	34.53	39.6	59.39	55.5	5.37	56.1
30.7	44.47	14.7	10.30	29.5	34.97	38.2	59.73	57.1	5.69	54.2
June 9.7	45.20	16.4	10.62	27.6	35.40	37.2	60.07	59.2	6.01	52.4
19.7	45.88	18.7	10.92	25.6	35.83	36.6	60.40	61.6	6.33	50.5
29.6	46.48	21.4	11.21	23.7	36.23	36.3	60.71	64.2	6.63	48.8
July 9.6	46.98	24.4	11.48	21.9	36.60	36.4	60.98	67.0	6.90	47.2
19.6	47.38	27.7	11.71	20.2	36.93	36.9	61.22	69.9	7.15	45.8
29.6	47.67	31.3	11.90	18.6	37.21	37.8	61.41	72.9	7.36	44.6
Aug. 8.5	47.83	35.0	12.06	17.2	37.44	39.0	61.56	75.8	7.53	43.6
18.5	47.87	38.7	12.17	16.0	37.60	40.4	61.67	78.7	7.66	42.8
28.5	47.79	42.4	12.24	15.1	37.70	42.1	61.72	81.4	7.74	42.3
Sept. 7.5	47.59	46.0	12.26	14.3	37.73	44.0	61.73	83.9	7.78	42.0
17.4	47.28	49.4	12.25	13.8	37.71	45.9	61.69	86.2	7.78	41.9
27.4	46.86	52.6	12.20	13.5	37.63	47.8	61.61	88.2	7.74	42.0
Oct. 7.4	46.35	55.4	12.12	13.4	37.50	49.6	61.50	89.9	7.67	42.2
17.4	45.76	57.9	12.02	13.5	37.33	51.3	61.37	91.3	7.58	42.6
27.3	45.11	59.9	11.91	13.7	37.13	52.7	61.21	92.2	7.47	43.1
Nov. 6.3	44.41	61.4	11.78	14.1	36.92	53.8	61.04	92.8	7.35	43.6
16.3	43.68	62.4	11.66	14.6	36.70	54.5	60.87	93.0	7.22	44.2
26.2	42.94	62.7	11.54	15.1	36.50	54.9	60.70	92.8	7.10	44.8
Dec. 6.2	42.21	62.5	11.43	15.8	36.30	54.9	60.53	92.2	6.99	45.4
16.2	41.52	61.6	11.33	16.5	36.13	54.4	60.38	91.2	6.90	46.0
26.2	40.88	60.2	11.26	17.3	36.00	53.6	60.25	89.8	6.82	46.6
36.1	40.31	58.2	11.21	18.1	35.90	52.4	60.14	88.1	6.76	47.1

## FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♑ Octantis.		♒ Aquarii.		♓ Aquarii.		♊ Aquarii.		♈ Lacertæ.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 22 14	° ' " -86 25	h m 22 16	° ' " - 1 50	h m 22 20	° ' " + 0 55	h m 22 25	° ' " -11 8	h m 22 27	° ' " +49 48
	s	"	s	"	s	"	s	"	s	"
Jan. 1.2	28.34	57.0	58.78	36.6	39.15	5.2	51.48	31.0	32.81	75.5
	1.97	2.8	.05	0.7	.05	0.8	.06	0.3	.19	1.9
11.1	26.37	54.2	58.73	37.3	39.10	4.4	51.42	31.3	32.62	73.6
	1.46	3.2	.02	0.7	.03	0.8	.03	0.2	.15	2.3
21.1	24.91	51.0	58.71	38.0	39.07	3.6	51.39	31.5	32.47	71.3
	0.91	3.4	.00	0.6	.01	0.7	.00	0.1	.11	2.5
31.1	24.00	47.6	58.71	38.6	39.06	2.9	51.39	31.6	32.36	68.8
	0.34	3.7	.03	0.5	.02	0.6	.02	0.1	.06	2.8
Feb. 10.0	23.66	43.9	58.74	39.1	39.08	2.3	51.41	31.5	32.30	66.0
	0.23	3.8	.05	0.3	.06	0.5	.05	0.3	.01	2.8
20.0	23.89	40.1	58.79	39.4	39.14	1.8	51.46	31.2	32.29	63.2
	0.79	3.8	.09	0.2	.08	0.3	.09	0.4	.05	2.7
Mar. 2.0	24.68	36.3	58.88	39.6	39.22	1.5	51.55	30.8	32.34	60.5
	1.32	3.7	.12	0.1	.11	0.1	.11	0.7	.11	2.5
12.0	26.00	32.6	59.00	39.5	39.33	1.4	51.66	30.1	32.45	58.0
	1.82	3.6	.15	0.4	.15	0.2	.15	0.9	.16	2.3
21.9	27.82	29.0	59.15	39.1	39.48	1.6	51.81	29.2	32.61	55.7
	2.28	3.3	.18	0.6	.18	0.5	.18	1.1	.22	1.9
31.9	30.10	25.7	59.33	38.5	39.66	2.1	51.99	28.1	32.83	53.8
	2.68	3.1	.22	0.8	.22	0.7	.22	1.3	.28	1.4
Apr. 10.9	32.78	22.6	59.55	37.7	39.88	2.8	52.21	26.8	33.11	52.4
	3.03	2.7	.25	1.1	.24	1.0	.24	1.5	.32	0.9
20.9	35.81	19.9	59.80	36.6	40.12	3.8	52.45	25.3	33.43	51.5
	3.32	2.2	.27	1.4	.27	1.3	.27	1.6	.36	0.4
30.8	39.13	17.7	60.07	35.2	40.39	5.1	52.72	23.7	33.79	51.1
	3.54	1.8	.29	1.6	.29	1.5	.30	1.8	.39	0.1
May 10.8	42.67	15.9	60.36	33.6	40.68	6.6	53.02	21.9	34.18	51.2
	3.69	1.3	.31	1.7	.31	1.7	.31	1.9	.41	0.7
20.8	46.36	14.6	60.67	31.9	40.99	8.3	53.33	20.0	34.59	51.9
	3.75	0.8	.32	1.9	.31	1.9	.32	1.9	.42	1.3
30.7	50.11	13.8	60.99	30.0	41.30	10.2	53.65	18.1	35.01	53.2
	3.73	0.3	.32	1.9	.32	1.9	.33	1.8	.41	1.7
June 9.7	53.84	13.5	61.31	28.1	41.62	12.1	53.98	16.3	35.42	54.9
	3.63	0.3	.31	2.0	.31	2.1	.32	1.8	.40	2.2
19.7	57.47	13.8	61.62	26.1	41.93	14.2	54.30	14.5	35.82	57.1
	3.44	0.8	.30	1.9	.30	2.0	.31	1.7	.37	2.6
29.7	60.91	14.6	61.92	24.2	42.23	16.2	54.61	12.8	36.19	59.7
	3.15	1.3	.27	1.9	.27	1.9	.28	1.6	.34	2.9
July 9.6	64.06	15.9	62.19	22.3	42.50	18.1	54.89	11.2	36.53	62.6
	2.78	1.8	.24	1.7	.25	1.8	.26	1.3	.29	3.1
19.6	66.84	17.7	62.43	20.6	42.75	19.9	55.15	9.9	36.82	65.7
	2.33	2.2	.21	1.5	.21	1.7	.22	1.1	.25	3.3
29.6	69.17	19.9	62.64	19.1	42.96	21.6	55.37	8.8	37.07	69.0
	1.82	2.6	.17	1.4	.17	1.5	.19	0.9	.19	3.4
Aug. 8.6	70.99	22.5	62.81	17.7	43.13	23.1	55.56	7.9	37.26	72.4
	1.24	2.8	.13	1.1	.13	1.3	.14	0.6	.13	3.4
18.5	72.23	25.3	62.94	16.6	43.26	24.4	55.70	7.3	37.39	75.8
	0.61	2.9	.09	0.9	.09	1.1	.10	0.4	.07	3.4
28.5	72.84	28.2	63.03	15.7	43.35	25.5	55.80	6.9	37.46	79.2
	0.02	3.0	.04	0.7	.04	0.9	.05	0.1	.01	3.2
Sept. 7.5	72.82	31.2	63.07	15.0	43.39	26.4	55.85	6.8	37.47	82.4
	0.66	3.0	.00	0.5	.00	0.6	.01	0.0	.04	3.1
17.4	72.16	34.2	63.07	14.5	43.39	27.0	55.86	6.8	37.43	85.5
	1.28	2.8	.03	0.3	.03	0.4	.02	0.3	.09	2.8
27.4	70.88	37.0	63.04	14.2	43.36	27.4	55.84	7.1	37.34	88.3
	1.85	2.5	.07	0.1	.06	0.3	.06	0.4	.13	2.5
Oct. 7.4	69.03	39.5	62.97	14.1	43.30	27.7	55.78	7.5	37.21	90.8
	2.34	2.1	.09	0.1	.09	0.0	.09	0.5	.18	2.2
17.4	66.69	41.6	62.88	14.2	43.21	27.7	55.69	8.0	37.03	93.0
	2.75	1.7	.10	0.3	.10	0.2	.10	0.6	.20	1.8
27.3	63.94	43.3	62.78	14.5	43.11	27.5	55.59	8.6	36.83	94.8
	3.05	1.1	.12	0.4	.12	0.3	.12	0.6	.23	1.3
Nov. 6.3	60.89	44.4	62.66	14.9	42.99	27.2	55.47	9.2	36.60	96.1
	3.21	0.5	.12	0.5	.12	0.4	.12	0.7	.25	0.8
16.3	57.68	44.9	62.54	15.4	42.87	26.8	55.35	9.9	36.35	96.9
	3.27	0.2	.12	0.6	.12	0.6	.12	0.6	.25	0.4
26.3	54.41	44.7	62.42	16.0	42.75	26.2	55.23	10.5	36.10	97.3
	3.18	0.8	.11	0.6	.11	0.6	.11	0.6	.25	0.2
Dec. 6.2	51.23	43.9	62.31	16.6	42.64	25.6	55.12	11.1	35.85	97.1
	2.98	1.5	.10	0.7	.10	0.7	.10	0.6	.24	0.7
16.2	48.25	42.4	62.21	17.3	42.54	24.9	55.02	11.7	35.61	96.4
	2.67	2.0	.08	0.7	.08	0.8	.08	0.5	.23	1.2
26.2	45.58	40.4	62.13	18.0	42.46	24.1	54.94	12.2	35.38	95.2
	2.27	2.5	.06	0.7	.07	0.8	.07	0.4	.20	1.6
36.1	43.31	37.9	62.07	18.7	42.39	23.3	54.87	12.6	35.18	93.6

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	226 Cephei (B.).		η Aquarii.		10 Lacertæ.		β Octantis.		ζ Pegasi.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 22 30	° ' " +75 45	h m 22 30	° ' " - 0 34	h m 22 35	° ' " +38 34	h m 22 36	° ' " -81 50	h m 22 36	° ' " +10 21
Jan. 1.2	37.71	54.8	42.28	62.3	11.42	56.6	49.36	98.0	56.75	35.4
11.1	37.00	53.0	42.22	63.0	11.28	54.9	48.43	95.5	56.68	34.3
21.1	36.40	50.7	42.18	63.7	11.18	52.8	47.70	92.6	56.63	33.2
31.1	35.91	48.0	42.17	64.4	11.10	50.6	47.19	89.4	56.60	32.0
Feb. 10.1	35.57	45.0	42.18	64.9	11.06	48.2	46.92	85.9	56.60	30.9
20.0	35.38	41.9	42.22	65.3	11.07	45.8	46.89	82.2	56.63	29.9
Mar. 2.0	35.36	38.7	42.30	65.5	11.12	43.5	47.09	78.5	56.70	29.0
12.0	35.51	35.5	42.40	65.4	11.21	41.4	47.53	74.7	56.79	28.4
21.9	35.81	32.6	42.54	65.1	11.35	39.6	48.20	71.0	56.92	28.0
31.9	36.27	30.0	42.72	64.6	11.54	38.1	49.08	67.5	57.09	28.0
Apr. 10.9	36.87	27.8	42.92	63.8	11.77	37.1	50.16	64.2	57.29	28.3
20.9	37.58	26.1	43.16	62.7	12.05	36.5	51.40	61.3	57.53	28.9
30.8	38.38	25.0	43.42	61.4	12.35	36.4	52.80	58.7	57.79	29.8
May 10.8	39.25	24.5	43.71	59.8	12.69	36.9	54.32	56.5	58.08	31.1
20.8	40.16	24.5	44.02	58.1	13.04	37.8	55.94	54.8	58.38	32.6
30.8	41.07	25.2	44.33	56.2	13.41	39.2	57.61	53.6	58.70	34.4
June 9.7	41.96	26.4	44.65	54.2	13.77	41.0	59.30	52.9	59.02	36.4
19.7	42.81	28.2	44.97	52.2	14.13	43.2	60.97	52.7	59.33	38.6
29.7	43.59	30.5	45.27	50.2	14.46	45.7	62.58	53.1	59.63	40.8
July 9.6	44.28	33.2	45.55	48.3	14.77	48.5	64.08	54.1	59.91	43.0
19.6	44.87	36.3	45.80	46.5	15.05	51.4	65.44	55.5	60.17	45.2
29.6	45.33	39.7	46.02	44.9	15.28	54.5	66.62	57.4	60.39	47.4
Aug. 8.6	45.66	43.3	46.20	43.4	15.47	57.6	67.58	59.7	60.57	49.4
18.5	45.86	47.0	46.34	42.2	15.60	60.6	68.30	62.3	60.71	51.2
28.5	45.92	50.8	46.44	41.2	15.69	63.6	68.74	65.1	60.81	52.9
Sept. 7.5	45.84	54.5	46.49	40.4	15.73	66.5	68.91	68.0	60.87	54.3
17.5	45.62	58.2	46.51	39.8	15.72	69.1	68.79	71.0	60.89	55.5
27.4	45.28	61.7	46.49	39.5	15.67	71.5	68.39	73.9	60.87	56.5
Oct. 7.4	44.82	65.0	46.43	39.4	15.58	73.7	67.73	76.5	60.82	57.2
17.4	44.25	67.9	46.35	39.4	15.46	75.5	66.83	78.9	60.74	57.7
27.3	43.59	70.4	46.25	39.6	15.31	76.9	65.74	80.8	60.64	58.0
Nov. 6.3	42.85	72.5	46.14	40.0	15.14	77.9	64.50	82.2	60.53	58.0
16.3	42.05	74.1	46.03	40.4	14.96	78.5	63.16	83.0	60.41	57.8
26.3	41.21	75.1	45.91	41.0	14.78	78.7	61.78	83.2	60.29	57.4
Dec. 6.2	40.36	75.4	45.80	41.6	14.59	78.4	60.41	82.4	60.17	56.8
16.2	39.52	75.2	45.70	42.3	14.41	77.7	59.10	81.8	60.06	56.0
26.2	38.71	74.4	45.61	43.0	14.25	76.5	57.90	80.2	59.96	55.1
36.2	37.96	73.0	45.54	43.8	14.10	75.0	56.86	78.0	59.88	54.1

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♈ Pegasi.			♉ Cephei.			♊ Aquarii.			♐ Piscis Australis. (Fomalhaut.)			♑ Andromedæ.			
	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion North.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion South.	Right Ascension.		Declina- tion North.	
	h m	°		h m	°		h m	°		h m	°		h m	°		
	22 42	+23 5		22 46	+65 43		22 47	- 8 3		22 52	-30 5		22 57	+41 50		
	s	"		s	"		s	"		s	"		s	"		
Jan. 1.2	10.00	.09	29.3	25.75	.39	45.7	53.65	.07	42.1	.05	39.23	.08	75.3	.04	44.84	.16
11.1	9.91	.07	27.9	25.36	.34	44.0	53.58	.05	42.6	.04	39.15	.06	74.9	.07	44.68	.14
21.1	9.84	.05	26.3	25.02	.27	41.8	53.53	.02	43.0	.02	39.09	.04	74.2	.09	44.54	.11
31.1	9.79	.02	24.6	24.75	.20	39.3	53.51	.00	43.2	.00	39.05	.00	73.3	1.2	44.43	.07
Feb. 10.1	9.77	.01	22.9	24.55	.11	36.4	53.51	.03	43.2	.01	39.05	.02	72.1	1.4	44.36	.03
20.0	9.78	.05	21.2	24.44	.01	33.4	53.54	.05	43.1	.03	39.07	.06	70.7	1.7	44.33	.02
Mar. 2.0	9.83	.09	19.7	24.43	.08	30.3	53.59	.09	42.8	.05	39.13	.10	69.0	1.8	44.35	.06
12.0	9.92	.13	18.4	24.51	.17	27.3	53.68	.13	42.3	.07	39.23	.14	67.2	2.0	44.41	.12
22.0	10.05	.17	17.3	24.68	.27	24.5	53.81	.16	41.6	1.0	39.37	.17	65.2	2.1	44.53	.17
31.9	10.22	.20	16.6	24.95	.36	22.0	53.97	.19	40.6	1.2	39.54	.21	63.1	2.2	44.70	.22
Apr. 10.9	10.42	.24	16.2	25.31	.43	20.0	54.16	.23	39.4	1.4	39.75	.25	60.9	2.3	44.92	.26
20.9	10.66	.27	16.2	25.74	.50	18.4	54.39	.26	38.0	1.6	40.00	.28	58.6	2.3	45.18	.30
30.8	10.93	.30	16.7	26.24	.54	17.3	54.65	.28	36.4	1.8	40.28	.31	56.3	2.3	45.48	.34
May 10.8	11.23	.31	17.6	26.78	.58	16.8	54.93	.30	34.6	1.9	40.59	.33	54.0	2.2	45.82	.36
20.8	11.54	.33	18.8	27.36	.59	16.9	55.23	.32	32.7	1.9	40.92	.35	51.8	2.0	46.18	.38
30.8	11.87	.33	20.4	27.95	.59	17.6	55.55	.32	30.8	2.0	41.27	.36	49.8	1.8	46.56	.38
June 9.7	12.20	.33	22.4	28.54	.57	18.9	55.87	.32	28.8	1.9	41.63	.36	48.0	1.6	46.94	.37
19.7	12.53	.31	24.5	29.11	.54	20.7	56.19	.31	26.9	1.9	41.99	.35	46.4	1.3	47.31	.36
29.7	12.84	.29	26.9	29.65	.48	22.9	56.50	.30	25.0	1.7	42.34	.33	45.1	1.0	47.67	.34
July 9.7	13.13	.26	29.4	30.13	.43	25.6	56.80	.27	23.3	1.6	42.67	.31	44.1	0.7	48.01	.30
19.6	13.39	.23	32.0	30.56	.35	28.7	57.07	.23	21.7	1.3	42.98	.28	43.4	0.3	48.31	.26
29.6	13.62	.19	34.6	30.91	.28	32.0	57.30	.20	20.4	1.1	43.26	.23	43.1	0.0	48.57	.22
Aug. 8.6	13.81	.14	37.2	31.19	.20	35.5	57.50	.16	19.3	0.9	43.49	.18	43.1	0.4	48.79	.17
18.5	13.95	.10	39.7	31.39	.11	39.2	57.66	.12	18.4	0.6	43.67	.14	43.5	0.7	48.96	.12
28.5	14.05	.06	42.0	31.50	.02	42.9	57.78	.08	17.8	0.3	43.81	.09	44.2	0.9	49.08	.07
Sept. 7.5	14.11	.01	44.1	31.52	.06	46.5	57.86	.03	17.5	0.2	43.90	.04	45.1	1.1	49.15	.02
17.5	14.12	.02	46.0	31.46	.14	50.1	57.89	.01	17.3	0.1	43.94	.00	46.2	1.3	49.17	.03
27.4	14.10	.05	47.7	31.32	.21	53.5	57.88	.04	17.4	0.3	43.94	.04	47.5	1.4	49.14	.07
Oct. 7.4	14.05	.09	49.1	31.11	.27	56.6	57.84	.06	17.7	0.4	43.90	.08	48.9	1.4	49.07	.10
17.4	13.96	.11	50.2	30.84	.33	59.5	57.78	.09	18.1	0.5	43.82	.10	50.3	1.3	48.97	.14
27.4	13.85	.12	51.0	30.51	.38	61.9	57.69	.10	18.6	0.6	43.72	.13	51.6	1.3	48.83	.16
Nov. 6.3	13.73	.13	51.5	30.13	.42	63.9	57.59	.11	19.2	0.6	43.59	.14	52.9	1.1	48.67	.18
16.3	13.60	.14	51.7	29.71	.47	65.4	57.48	.12	19.8	0.7	43.45	.14	54.0	0.8	48.49	.19
26.3	13.46	.14	51.6	29.27	.46	66.4	57.36	.11	20.5	0.6	43.31	.14	54.8	0.6	48.30	.19
Dec. 6.2	13.32	.13	51.2	28.81	.45	66.8	57.25	.10	21.1	0.6	43.17	.13	55.4	0.4	48.11	.19
16.2	13.19	.12	50.4	28.36	.44	66.6	57.15	.09	21.7	0.6	43.04	.11	55.8	0.0	47.92	.18
26.2	13.07	.10	49.4	27.92	.41	65.8	57.06	.08	22.3	0.5	42.93	.10	55.8	0.2	47.74	.17
36.2	12.97		48.1	27.51		64.5	56.98		22.8		42.83		55.6		47.57	

# FIXED STARS, 1910.

(CONSTANTS OF STRUVE AND PETERS.)

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## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>a</i> Pegasi. ( <i>Murkab.</i> )		$\phi$ Aquarii.		$\alpha$ Cephei.		$\tau$ Pegasi.		$\theta$ Piscium.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.
	h m 23 0	° +14 43	h m 23 9	° - 6 31	h m 23 14	° +67 36	h m 23 16	° +23 14	h m 23 23	° + 5 52
	s	"	s	"	s	"	s	"	s	"
Jan. 1.2	15.06	11.7	38.27	73.9	52.97	78.8	9.32	50.8	22.75	58.5
	.09	1.1	.08	0.5	.45	1.3	.11	1.2	.09	0.8
11.2	14.97	10.6	38.19	74.4	52.52	77.5	9.21	49.6	22.66	57.7
	.07	1.2	.06	0.4	.41	1.8	.09	1.4	.08	0.9
21.1	14.90	9.4	38.13	74.8	52.11	75.7	9.12	48.2	22.58	56.8
	.05	1.3	.04	0.3	.35	2.3	.08	1.5	.06	0.8
31.1	14.85	8.1	38.09	75.1	51.76	73.4	9.04	46.7	22.52	56.0
	.02	1.3	.02	0.1	.28	2.6	.05	1.6	.04	0.8
Feb. 10.1	14.83	6.8	38.07	75.2	51.48	70.8	8.99	45.1	22.48	55.2
	.00	1.2	.01	0.0	.19	2.9	.02	1.6	.01	0.6
20.1	14.83	5.6	38.08	75.2	51.29	67.9	8.97	43.5	22.47	54.6
	.04	1.0	.03	0.2	.09	3.0	.01	1.4	.01	0.5
Mar. 2.0	14.87	4.6	38.11	75.0	51.20	64.9	8.98	42.1	22.48	54.1
	.07	0.9	.07	0.5	.01	3.0	.06	1.3	.05	0.3
12.0	14.94	3.7	38.18	74.5	51.21	61.9	9.04	40.8	22.53	53.8
	.11	0.6	.10	0.6	.12	2.9	.09	1.1	.09	0.1
22.0	15.05	3.1	38.28	73.9	51.33	59.0	9.13	39.7	22.62	53.7
	.14	0.3	.14	0.9	.23	2.7	.13	0.8	.12	0.2
31.9	15.19	2.8	38.42	73.0	51.56	56.3	9.26	38.9	22.74	53.9
	.18	0.0	.17	1.2	.32	2.3	.18	0.5	.16	0.5
Apr. 10.9	15.37	2.8	38.59	71.8	51.88	54.0	9.44	38.4	22.90	54.4
	.22	0.4	.21	1.4	.41	1.9	.21	0.1	.20	0.8
20.9	15.59	3.2	38.80	70.4	52.29	52.1	9.65	38.3	23.10	55.2
	.26	0.7	.24	1.6	.49	1.4	.25	0.3	.23	1.1
30.9	15.85	3.9	39.04	68.8	52.78	50.7	9.90	38.6	23.33	56.3
	.28	1.1	.27	1.7	.55	0.8	.28	0.7	.26	1.3
May 10.8	16.13	5.0	39.31	67.1	53.33	49.9	10.18	39.3	23.59	57.6
	.30	1.4	.29	1.9	.61	0.2	.31	1.1	.29	1.6
20.8	16.43	6.4	39.60	65.2	53.94	49.7	10.49	40.4	23.88	59.2
	.32	1.7	.32	2.0	.63	0.3	.32	1.5	.31	1.8
30.8	16.75	8.1	39.92	63.2	54.57	50.0	10.81	41.9	24.19	61.0
	.32	1.9	.32	2.0	.64	0.9	.33	1.8	.31	1.9
June 9.7	17.07	10.0	40.24	61.2	55.21	50.9	11.14	43.7	24.50	62.9
	.32	2.1	.32	2.0	.63	1.4	.34	2.0	.32	2.1
19.7	17.39	12.1	40.56	59.2	55.84	52.3	11.48	45.7	24.82	65.0
	.31	2.3	.32	2.0	.60	1.9	.32	2.2	.32	2.1
29.7	17.70	14.4	40.88	57.2	56.44	54.2	11.80	47.9	25.14	67.1
	.30	2.3	.30	1.8	.56	2.4	.31	2.4	.30	2.1
July 9.7	18.00	16.7	41.18	55.4	57.00	56.6	12.11	50.3	25.44	69.2
	.27	2.3	.28	1.6	.51	2.8	.29	2.5	.28	2.1
19.6	18.27	19.0	41.46	53.8	57.51	59.4	12.40	52.8	25.72	71.3
	.24	2.3	.25	1.5	.44	3.1	.25	2.6	.26	2.0
29.6	18.51	21.3	41.71	52.3	57.95	62.5	12.65	55.4	25.98	73.3
	.20	2.2	.21	1.2	.36	3.4	.22	2.5	.22	1.8
Aug. 8.6	18.71	23.5	41.92	51.1	58.31	65.9	12.87	57.9	26.20	75.1
	.16	2.1	.18	1.0	.28	3.6	.18	2.4	.18	1.7
18.6	18.87	25.6	42.10	50.1	58.59	69.5	13.05	60.3	26.38	76.8
	.12	1.9	.14	0.8	.19	3.7	.14	2.3	.15	1.5
28.5	18.99	27.5	42.24	49.3	58.78	73.2	13.19	62.6	26.53	78.3
	.08	1.7	.09	0.5	.10	3.7	.09	2.2	.10	1.2
Sept. 7.5	19.07	29.2	42.33	48.8	58.88	76.9	13.28	64.8	26.63	79.5
	.04	1.5	.06	0.2	.01	3.6	.06	2.0	.06	1.0
17.5	19.11	30.7	42.39	48.6	58.89	80.5	13.34	66.8	26.69	80.5
	.00	1.2	.01	0.0	.07	3.6	.01	1.8	.03	0.8
27.5	19.11	31.9	42.40	48.6	58.82	84.1	13.35	68.6	26.72	81.3
	.03	1.0	.02	0.2	.15	3.4	.02	1.5	.00	0.5
Oct. 7.4	19.08	32.9	42.38	48.8	58.67	87.5	13.33	70.1	26.72	81.8
	.06	0.8	.04	0.3	.23	3.1	.05	1.3	.04	0.3
17.4	19.02	33.7	42.34	49.1	58.44	90.6	13.28	71.4	26.68	82.1
	.09	0.5	.07	0.5	.30	2.8	.08	0.9	.06	0.1
27.4	18.93	34.2	42.27	49.6	58.14	93.4	13.20	72.3	26.62	82.2
	.10	0.3	.09	0.6	.36	2.4	.10	0.7	.08	0.0
Nov. 6.3	18.83	34.5	42.18	50.2	57.78	95.8	13.10	73.0	26.54	82.2
	.11	0.0	.10	0.6	.41	1.9	.11	0.4	.09	0.3
16.3	18.72	34.5	42.08	50.8	57.37	97.7	12.99	73.4	26.45	81.9
	.12	0.3	.11	0.7	.44	1.4	.13	0.1	.10	0.4
26.3	18.60	34.2	41.97	51.5	56.93	99.1	12.86	73.5	26.35	81.5
	.12	0.4	.11	0.7	.48	0.8	.13	0.3	.11	0.5
Dec. 6.3	18.48	33.8	41.86	52.2	56.45	99.9	12.73	73.2	26.24	81.0
	.11	0.7	.10	0.6	.49	0.3	.12	0.5	.11	0.6
16.2	18.37	33.1	41.76	52.8	55.96	100.2	12.61	72.7	26.13	80.4
	.11	0.9	.10	0.6	.48	0.4	.13	0.8	.10	0.7
26.2	18.26	32.2	41.66	53.4	55.48	99.8	12.48	71.9	26.03	79.7
	.09	1.0	.09	0.6	.47	0.9	.11	1.1	.09	0.8
36.2	18.17	31.2	41.57	54.0	55.01	98.9	12.37	70.8	25.94	78.9

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\lambda$ Andromedæ.			$\epsilon$ Piscium.			$\gamma$ Cephei.			$\delta$ Aquarii.		
	Right Ascension.		Declination North.	Right Ascension.		Declination North.	Right Ascension.		Declination North.	Right Ascension.		Declination South.
	h	m	°	h	m	°	h	m	°	h	m	°
	23	33	+45 57	23	35	+ 5 8	23	35	+77 7	23	39	-18 46
	s		"	s		"	s		"	s		"
Jan. 1.2	7.68		80.4	17.92		12.3	35.42		60.7	30.87		49.7
		.20	1.2		.09	0.8		0.88	0.9		.10	0.2
11.2	7.48	.18	79.2	17.83	.08	11.5	34.54	0.82	59.8	30.77	.09	49.9
21.2	7.30	.16	77.6	17.75	.07	10.7	33.72	0.73	58.3	30.68	.07	49.8
31.1	7.14	.12	75.6	17.68	.05	9.9	32.99	0.60	56.3	30.61	.05	49.5
Feb. 10.1	7.02	.08	73.4	17.63	.02	9.2	32.39	0.46	53.9	30.56	.02	49.0
			2.3			0.6			2.7			0.7
20.1	6.94		71.1	17.61		8.6	31.93		51.2	30.54		48.3
		.04	2.4		.01	0.5		0.30	3.0		.01	1.0
Mar. 2.0	6.90	.02	68.7	17.62	.04	8.1	31.63	0.12	48.2	30.55	.03	47.3
			2.4			0.2			3.1			1.2
12.0	6.92	.07	66.3	17.66	.07	7.9	31.51	0.07	45.1	30.58	.08	46.1
			2.2			0.0			3.1			1.5
22.0	6.99	.13	64.1	17.73	.11	7.9	31.58	0.26	42.0	30.66	.11	44.6
Apr. 1.0	7.12	.19	62.1	17.84	.15	8.1	31.84	0.43	39.1	30.77	.15	43.0
			1.6			0.5			2.6			1.9
10.9	7.31	.24	60.5	17.99	.19	8.6	32.27		36.5	30.92	.19	41.1
			1.3			0.8		0.59	2.3			2.0
20.9	7.55	.29	59.2	18.18	.22	9.4	32.86	0.73	34.2	31.11	.22	39.1
			0.8			1.1			1.8			2.1
30.9	7.84	.33	58.4	18.40	.26	10.5	33.59	0.84	32.4	31.33	.26	37.0
			0.3			1.3			1.3			2.2
May 10.9	8.17	.37	58.1	18.66	.28	11.8	34.43	0.93	31.1	31.59	.29	34.8
			0.2			1.6		0.99	0.8			2.3
20.8	8.54	.39	58.3	18.94	.31	13.4	35.36		30.3	31.88	.31	32.5
			0.7			1.8			0.2			2.2
30.8	8.93	.40	59.0	19.25	.31	15.2	36.35	1.02	30.1	32.19	.33	30.3
			1.2			1.9			0.4			2.2
June 9.8	9.33	.40	60.2	19.56	.32	17.1	37.37	1.02	30.5	32.52	.33	28.1
			1.7			2.1			1.0			2.0
19.7	9.73	.40	61.9	19.88	.32	19.2	38.39	0.98	31.5	32.85	.34	26.1
			2.0			2.1			1.5			1.9
29.7	10.13	.37	63.9	20.20	.31	21.3	39.37	0.92	33.0	33.19	.32	24.2
			2.4			2.1		0.85	2.0			1.6
July 9.7	10.50	.35	66.3	20.51	.29	23.4	40.29		35.0	33.51	.31	22.6
			2.7			2.0			2.5			1.4
19.6	10.85	.32	69.0	20.80	.26	25.4	41.14	0.75	37.5	33.82	.28	21.2
			2.9			2.0		0.75	2.9			1.0
29.6	11.17	.27	71.9	21.06	.23	27.4	41.89	0.63	40.4	34.10	.25	20.2
			3.0			1.8			3.2			0.8
Aug. 8.6	11.44	.22	74.9	21.29	.20	29.2	42.52	0.50	43.6	34.35	.21	19.4
			3.2			1.6		0.50	3.5			0.4
18.6	11.66	.17	78.1	21.49	.15	30.8	43.02	0.37	47.1	34.56	.17	19.0
			3.2			1.4		0.22	3.6			0.2
28.5	11.83	.12	81.3	21.64	.12	32.2	43.39		50.7	34.73	.13	18.8
			3.1			1.2			3.8			0.2
Sept. 7.5	11.95	.07	84.4	21.76	.08	33.4	43.61	0.08	54.5	34.86	.09	19.0
			3.0			0.9		0.07	3.9			0.5
17.5	12.02	.02	87.4	21.84	.04	34.3	43.69	0.21	58.4	34.95	.05	19.5
			2.9			0.7			3.8			0.7
27.5	12.04	.02	90.3	21.88	.01	35.0	43.62	0.35	62.2	35.00	.01	20.2
			2.7			0.5		0.35	3.6			0.9
Oct. 7.4	12.02	.07	93.0	21.89	.02	35.5	43.41	0.47	65.8	35.01	.03	21.1
			2.4			0.3			3.5			1.0
17.4	11.95	.10	95.4	21.87	.05	35.8	43.06		69.3	34.98	.05	22.1
			2.1			0.1			3.2			1.1
27.4	11.85	.14	97.5	21.82	.07	35.9	42.59	0.59	72.5	34.93	.08	23.2
			1.8			0.1		0.70	2.9			1.1
Nov. 6.4	11.71	.16	99.3	21.75	.09	35.8	42.00	0.79	75.4	34.85	.09	24.3
			1.3			0.3			2.4			1.0
16.3	11.55	.18	100.6	21.66	.10	35.5	41.30	0.85	77.8	34.76	.11	25.3
			0.9			0.4		0.89	1.9			1.0
26.3	11.37	.20	101.5	21.56	.10	35.1	40.51		79.7	34.65	.11	26.3
			0.5			0.5			1.4			0.9
Dec. 6.3	11.17	.21	102.0	21.46	.10	34.6	39.66	0.91	81.1	34.54	.12	27.2
			0.0			0.6		0.90	0.8			0.7
16.3	10.96	.21	102.0	21.36	.10	34.0	38.77		81.9	34.42	.11	27.9
			0.5			0.7			0.1			0.5
26.2	10.75	.20	101.5	21.26	.10	33.3	37.86	0.90	82.0	34.31	.10	28.4
			1.0			0.8			0.5			0.3
36.2	10.55		100.5	21.16		32.5	36.96		81.5	34.21		28.7



# FIXED STARS, 1910.

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(CONSTANTS OF STRUVE AND PETERS.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	♄ Sculptoris.		γ Octantis.		Groombridge 4163.		ω Piscium.	
	Right Ascension.	Declination South.	Right Ascension.	Declination South.	Right Ascension.	Declination North.	Right Ascension.	Declination North.
	h m 23 44	° ' " -28 37	h m 23 46	° ' " -82 30	h m 23 50	° ' " +73 54	h m 23 54	° ' " + 6 21
Jan. 1.2	13.16	59.0	49.31	94.5	23.65	46.7	40.13	49.0
11.2	13.04	58.9	47.93	92.8	22.95	45.9	40.03	48.3
21.2	12.94	58.5	46.69	90.5	22.30	44.6	39.94	47.5
31.1	12.86	57.8	45.63	87.8	21.71	42.8	39.86	46.7
Feb. 10.1	12.80	56.8	44.78	84.7	21.21	40.5	39.80	46.0
20.1	12.77	55.5	44.15	81.2	20.81	37.8	39.76	45.4
Mar. 2.1	12.77	54.0	43.77	77.5	20.54	34.9	39.74	44.9
12.0	12.80	52.2	43.64	73.7	20.42	31.9	39.76	44.6
22.0	12.87	50.2	43.76	69.8	20.44	28.9	39.82	44.6
Apr. 1.0	12.98	48.0	44.13	65.9	20.61	26.0	39.91	44.7
11.0	13.13	45.6	44.75	62.2	20.92	23.4	40.04	45.2
20.9	13.32	43.2	45.60	58.6	21.37	21.1	40.21	45.9
30.9	13.56	40.7	46.66	55.3	21.94	19.2	40.42	46.9
May 10.9	13.82	38.2	47.92	52.3	22.61	17.8	40.66	48.2
20.8	14.12	35.7	49.36	49.7	23.36	16.9	40.93	49.7
30.8	14.45	33.3	50.93	47.6	24.17	16.6	41.23	51.4
June 9.8	14.79	31.1	52.60	45.9	25.01	16.9	41.54	53.3
19.8	15.14	29.1	54.34	44.8	25.85	17.8	41.86	55.4
29.7	15.50	27.4	56.10	44.3	26.68	19.2	42.18	57.5
July 9.7	15.84	26.0	57.83	44.3	27.47	21.1	42.49	59.6
19.7	16.17	24.9	59.49	44.9	28.21	23.5	42.79	61.7
29.6	16.47	24.2	61.03	46.0	28.87	26.2	43.06	63.7
Aug. 8.6	16.74	23.9	62.41	47.6	29.44	29.3	43.31	65.5
18.6	16.97	23.9	63.57	49.7	29.92	32.7	43.52	67.2
28.6	17.16	24.3	64.48	52.2	30.28	36.3	43.69	68.7
Sept. 7.5	17.30	25.1	65.11	55.0	30.53	40.0	43.83	70.0
17.5	17.40	26.1	65.45	57.9	30.67	43.8	43.93	71.0
27.5	17.45	27.3	65.48	60.9	30.69	47.6	43.99	71.8
Oct. 7.5	17.46	28.7	65.20	63.9	30.59	51.2	44.01	72.4
17.4	17.43	30.2	64.62	66.8	30.38	54.7	44.01	72.8
27.4	17.37	31.7	63.77	69.3	30.07	58.0	43.98	72.9
Nov. 6.4	17.28	33.2	62.68	71.5	29.66	60.9	43.92	72.9
16.4	17.17	34.6	61.40	73.2	29.16	63.4	43.85	72.7
26.3	17.05	35.8	59.97	74.3	28.59	65.4	43.76	72.4
Dec. 6.3	16.92	36.8	58.46	74.9	27.95	66.8	43.66	71.9
16.3	16.79	37.5	56.91	74.8	27.27	67.7	43.56	71.4
26.2	16.67	37.9	55.38	74.1	26.57	68.0	43.46	70.7
36.2	16.55	38.0	53.92	72.8	25.87	67.7	43.36	70.0

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
Jan. 1	18 45 24.11	24.76	-23 2 29.3	28.6	11.042	+ 11.97	+ 3 31.90	16 17.88	1 11.06	18 41 52.28
2	18 49 48.95	49.69	22 57 28.2	27.4	11.029	13.12	4 0.18	16 17.86	1 11.01	18 45 48.84
3	18 54 13.47	14.30	22 51 59.7	58.6	11.015	14.26	4 28.15	16 17.85	1 10.97	18 49 45.40
4	18 58 37.63	38.55	22 46 3.8	2.5	10.999	15.40	4 55.77	16 17.84	1 10.92	18 53 41.96
5	19 3 1.40	2.40	22 39 40.8	39.3	10.981	16.52	5 23.01	16 17.82	1 10.86	18 57 38.52
6	19 7 24.77	25.85	-22 32 50.9	49.1	10.964	+ 17.64	+ 5 49.84	16 17.80	1 10.80	19 1 35.08
7	19 11 47.71	48.86	22 25 34.3	32.2	10.946	18.75	6 16.22	16 17.77	1 10.74	19 5 31.64
8	19 16 10.16	11.39	22 17 51.1	48.7	10.926	19.85	6 42.12	16 17.74	1 10.67	19 9 28.19
9	19 20 32.11	33.42	22 9 41.5	39.0	10.903	20.94	7 7.51	16 17.70	1 10.60	19 13 24.75
10	19 24 53.53	54.91	22 1 5.9	3.2	10.880	22.02	7 32.37	16 17.66	1 10.53	19 17 21.31
11	19 29 14.38	15.83	-21 52 4.5	1.4	10.857	+ 23.10	+ 7 56.68	16 17.62	1 10.45	19 21 17.87
12	19 33 34.65	36.17	21 42 37.5	34.0	10.832	24.16	8 20.40	16 17.57	1 10.37	19 25 14.43
13	19 37 54.31	55.90	21 32 45.2	41.4	10.805	25.20	8 43.50	16 17.52	1 10.28	19 29 10.99
14	19 42 13.33	14.97	21 22 27.8	23.8	10.778	26.24	9 5.96	16 17.47	1 10.19	19 33 7.55
15	19 46 31.68	33.38	21 11 45.8	41.5	10.750	27.27	9 27.76	16 17.41	1 10.10	19 37 4.11
16	19 50 49.35	51.11	-21 0 39.5	34.8	10.721	+ 28.28	+ 9 48.86	16 17.35	1 10.01	19 41 0.66
17	19 55 6.31	8.13	20 49 9.1	4.1	10.692	29.26	10 9.26	16 17.28	1 9.91	19 44 57.22
18	19 59 22.53	24.40	20 37 15.0	9.7	10.660	30.24	10 28.93	16 17.21	1 9.81	19 48 53.77
19	20 3 38.01	39.93	20 24 57.5	51.9	10.629	31.21	10 47.85	16 17.13	1 9.71	19 52 50.33
20	20 7 52.74	54.71	20 12 17.0	11.0	10.597	32.17	11 6.02	16 17.05	1 9.61	19 56 46.89
21	20 12 6.71	8.73	-19 59 13.8	7.5	10.565	+ 33.10	+ 11 23.42	16 16.96	1 9.51	20 0 43.44
22	20 16 19.91	21.96	19 45 48.3	41.6	10.533	34.03	11 40.05	16 16.87	1 9.41	20 4 40.00
23	20 20 32.32	34.39	19 31 60.7	53.7	10.501	34.95	11 55.89	16 16.77	1 9.30	20 8 36.56
24	20 24 43.93	46.04	19 17 51.6	44.3	10.467	35.83	12 10.93	16 16.66	1 9.19	20 12 33.12
25	20 28 54.75	56.90	19 3 21.3	13.7	10.434	36.71	12 25.18	16 16.55	1 9.08	20 16 29.68
26	20 33 4.77	6.96	-18 48 30.1	22.2	10.401	+ 37.56	+ 12 38.64	16 16.44	1 8.97	20 20 26.24
27	20 37 13.99	16.22	18 33 18.3	10.1	10.368	38.41	12 51.31	16 16.32	1 8.86	20 24 22.79
28	20 41 22.42	24.68	18 17 46.4	37.9	10.335	39.25	13 3.18	16 16.18	1 8.75	20 28 19.34
29	20 45 30.05	32.34	18 1 54.7	46.0	10.302	40.07	13 14.24	16 16.04	1 8.63	20 32 15.90
30	20 49 36.88	39.18	17 45 43.7	34.6	10.268	40.86	13 24.50	16 15.91	1 8.51	20 36 12.46
31	20 53 42.90	45.21	-17 29 13.7	4.2	10.234	+ 41.65	+ 13 33.96	16 15.77	1 8.39	20 40 9.01
Feb. 1	20 57 48.11	50.44	17 12 25.1	15.3	10.200	42.41	13 42.62	16 15.62	1 8.28	20 44 5.57
2	21 1 52.51	54.87	16 55 18.2	8.2	10.167	43.16	13 50.48	16 15.47	1 8.16	20 48 2.12
3	21 5 56.12	58.49	16 37 53.4	43.1	10.134	43.90	13 57.53	16 15.31	1 8.04	20 51 58.68
4	21 9 58.93	61.30	16 20 11.2	0.7	10.101	44.61	14 3.78	16 15.15	1 7.93	20 55 55.24
5	21 14 0.94	3.32	-16 2 12.0	1.3	10.067	+ 45.32	+ 14 9.22	16 14.98	1 7.81	20 59 51.79
6	21 18 2.16	4.54	15 43 56.1	45.3	10.034	46.01	14 13.87	16 14.81	1 7.70	21 3 48.35
7	21 22 2.58	4.97	15 25 24.0	12.9	10.001	46.67	14 17.73	16 14.64	1 7.58	21 7 44.90
8	21 26 2.20	4.60	15 6 36.1	24.8	9.968	47.32	14 20.79	16 14.47	1 7.47	21 11 41.46
9	21 30 1.03	3.42	14 47 33.0	21.5	9.935	47.94	14 23.06	16 14.29	1 7.36	21 15 38.01
10	21 33 59.08	61.46	-14 28 15.0	3.3	9.902	+ 48.56	+ 14 24.54	16 14.11	1 7.25	21 19 34.57
11	21 37 56.34	58.72	14 8 42.4	30.6	9.870	49.16	14 25.23	16 13.93	1 7.14	21 23 31.13
12	21 41 52.82	55.19	13 48 55.7	43.8	9.837	49.73	14 25.14	16 13.75	1 7.04	21 27 27.68
13	21 45 48.52	50.88	13 28 55.4	43.3	9.805	50.29	14 24.28	16 13.56	1 6.93	21 31 24.24
14	21 49 43.45	45.80	13 8 42.0	29.7	9.773	50.83	14 22.65	16 13.37	1 6.82	21 35 20.79
15	21 53 37.62	39.96	-12 48 15.9	3.6	9.741	+ 51.34	+ 14 20.26	16 13.18	1 6.72	21 39 17.35

NOTE.—For mean time interval of semidiameter passing meridian, subtract 05.19 from the sidereal interval.

[Eph 10]

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.		
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.						
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s		
Feb.	15	21 53 37.62	39.96	- 12 48 18.9	3.6	9.741	+ 51.34	+ 14 20.26	16 13.18	I 6.72	21 39 17.35	
	16	21 57 31.04	33.37	12 27 37.6	25.2	9.710	51.84	14 17.12	16 12.99	I 6.62	21 43 13.90	
	17	22 1 23.72	26.03	12 6 47.3	34.8	9.680	52.33	14 13.24	16 12.79	I 6.52	21 47 10.46	
	18	22 5 15.67	17.96	11 45 45.5	33.0	9.650	52.81	14 8.64	16 12.59	I 6.42	21 51 7.01	
	19	22 9 6.91	9.17	11 24 32.7	20.2	9.621	53.26	14 3.33	16 12.39	I 6.32	21 55 3.57	
	20	22 12 57.47	59.69	- 11 2 69.3	56.8	9.592	+ 53.69	+ 13 57.32	16 12.18	I 6.22	21 59 0.12	
	21	22 16 47.35	49.55	10 41 35.7	23.2	9.564	54.11	13 50.63	16 11.96	I 6.12	22 2 56.67	
	22	22 20 36.56	38.75	10 19 52.3	39.8	9.537	54.51	13 43.29	16 11.74	I 6.02	22 6 53.23	
	23	22 24 25.14	27.30	9 57 59.5	47.0	9.511	54.89	13 35.31	16 11.52	I 5.93	22 10 49.78	
	24	22 28 13.10	15.23	9 35 57.6	45.2	9.487	55.26	13 26.71	16 11.29	I 5.84	22 14 46.34	
	25	22 32 0.46	2.56	- 9 13 47.1	34.7	9.462	+ 55.62	+ 13 17.51	16 11.06	I 5.75	22 18 42.89	
	26	22 35 47.25	49.32	8 51 28.3	16.0	9.438	55.95	13 7.74	16 10.83	I 5.67	22 22 39.45	
	27	22 39 33.48	35.51	8 28 61.6	49.4	9.415	56.27	12 57.41	16 10.59	I 5.59	22 26 36.00	
	28	22 43 19.16	21.15	8 6 27.4	15.2	9.392	56.58	12 46.54	16 10.35	I 5.52	22 30 32.55	
	Mar.	1	22 47 4.32	6.28	7 43 46.1	34.0	9.370	56.86	12 35.15	16 10.11	I 5.44	22 34 29.11
		2	22 50 48.98	50.90	- 7 20 58.0	46.1	9.350	+ 57.14	+ 12 23.25	16 9.86	I 5.36	22 38 25.66
		3	22 54 33.15	35.05	6 57 63.4	51.7	9.331	57.39	12 10.87	16 9.61	I 5.28	22 42 22.21
		4	22 58 16.87	18.73	6 34 62.9	51.3	9.312	57.64	11 58.02	16 9.35	I 5.21	22 46 18.77
		5	23 2 0.15	1.97	6 11 56.9	45.4	9.294	57.87	11 44.73	16 9.10	I 5.14	22 50 15.32
		6	23 5 43.00	44.79	5 48 45.6	34.4	9.277	58.07	11 31.03	16 8.84	I 5.08	22 54 11.87
7		23 9 25.44	27.19	- 5 25 29.3	18.4	9.260	+ 58.27	+ 11 16.93	16 8.78	I 5.03	22 58 8.43	
8		23 13 7.49	9.20	5 1 68.6	57.9	9.245	58.45	11 2.44	16 8.32	I 4.97	23 2 4.98	
9		23 16 49.18	50.84	4 38 44.0	33.4	9.229	58.60	10 47.57	16 8.05	I 4.91	23 6 1.54	
10		23 20 30.51	32.13	4 15 15.7	5.3	9.215	58.75	10 32.33	16 7.79	I 4.86	23 9 58.09	
11	23 24 11.50	13.08	3 51 44.1	33.9	9.201	58.88	10 16.76	16 7.54	I 4.81	23 13 54.64		
	12	23 27 52.16	53.70	- 3 27 69.7	59.8	9.188	+ 58.98	+ 10 0.88	16 7.28	I 4.77	23 17 51.20	
	13	23 31 32.52	34.00	3 4 32.8	23.2	9.175	59.07	9 44.69	16 7.02	I 4.73	23 21 47.75	
	14	23 35 12.58	14.02	2 40 53.9	44.6	9.164	59.16	9 28.19	16 6.76	I 4.69	23 25 44.30	
	15	23 38 52.36	53.76	2 17 13.4	4.4	9.153	59.21	9 11.41	16 6.50	I 4.65	23 29 40.86	
	16	23 42 31.87	33.23	1 53 31.8	23.0	9.142	59.26	8 54.38	16 6.24	I 4.61	23 33 37.41	
	17	23 46 11.14	12.46	- 1 29 49.3	40.7	9.132	+ 59.29	+ 8 37.10	16 5.97	I 4.58	23 37 33.96	
	18	23 49 50.20	51.47	1 5 66.4	58.2	9.123	59.29	8 19.61	16 5.71	I 4.55	23 41 30.52	
	19	23 53 29.07	30.30	0 42 23.4	15.6	9.115	59.29	8 1.93	16 5.45	I 4.53	23 45 27.07	
	20	23 57 7.76	8.94	- 0 18 40.6	33.1	9.109	59.27	7 44.06	16 5.18	I 4.51	23 49 23.62	
	21	0 0 46.29	47.42	+ 0 5 1.4	8.8	9.103	59.23	7 26.04	16 4.91	I 4.49	23 53 20.17	
	22	0 4 24.70	25.78	+ 0 28 42.4	49.5	9.098	+ 59.18	+ 7 7.89	16 4.64	I 4.48	23 57 16.73	
	23	0 8 3.00	4.04	0 52 22.1	28.8	9.094	59.12	6 49.64	16 4.37	I 4.47	0 1 13.28	
	24	0 11 41.21	42.20	1 16 0.3	6.6	9.091	59.05	6 31.30	16 4.10	I 4.46	0 5 9.83	
	25	0 15 19.36	20.31	1 39 36.4	42.5	9.090	58.95	6 12.90	16 3.82	I 4.45	0 9 6.39	
	26	0 18 57.47	58.36	2 3 10.2	16.0	9.089	58.85	5 54.46	16 3.54	I 4.44	0 13 2.94	
	27	0 22 35.55	36.40	+ 2 26 41.3	46.9	9.088	+ 58.73	+ 5 36.01	16 3.26	I 4.44	0 16 59.49	
	28	0 26 13.64	14.46	2 50 9.4	14.7	9.088	58.60	5 17.57	16 2.99	I 4.44	0 20 56.05	
	29	0 29 51.77	52.55	3 13 34.2	39.1	9.090	58.46	4 59.15	16 2.71	I 4.44	0 24 52.60	
	30	0 33 29.96	30.68	3 36 55.3	59.8	9.093	58.30	4 40.77	16 2.43	I 4.45	0 28 49.15	
	31	0 37 8.22	8.89	4 0 12.4	16.5	9.096	58.12	4 22.48	16 2.14	I 4.46	0 32 45.71	
Apr.	1	0 40 46.58	47.20	+ 4 23 25.1	29.0	9.101	+ 57.93	+ 4 4.28	16 1.86	I 4.47	0 36 42.26	

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0<sup>s</sup>.18 from the sidereal interval.

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
Apr. 1	0 40 46.58	47.20	+ 4 23 25.1	29.0	9.101	+ 57.93	+ 4 4.28	16 1.86	1 4.47	0 36 42.26
2	0 44 25.05	25.63	4 46 33.3	37.0	9.106	57.73	3 46.20	16 1.58	1 4.48	0 40 38.81
3	0 48 3.66	4.20	5 9 36.5	39.8	9.112	57.52	3 28.26	16 1.30	1 4.50	0 44 35.37
4	0 51 42.42	42.92	5 32 34.4	37.3	9.119	57.29	3 10.48	16 1.02	1 4.53	0 48 31.92
5	0 55 21.36	21.81	5 55 26.5	29.2	9.127	57.04	2 52.87	16 0.74	1 4.56	0 52 28.47
6	0 59 0.49	0.89	+ 6 18 12.5	15.0	9.135	+ 56.78	+ 2 35.45	16 0.45	1 4.59	0 56 25.03
7	1 2 39.83	40.19	6 40 52.2	54.5	9.144	56.51	2 18.24	16 0.17	1 4.62	1 0 21.58
8	1 6 19.39	19.71	7 3 25.2	27.2	9.153	56.23	2 1.25	15 59.89	1 4.65	1 4 18.14
9	1 9 59.19	59.46	7 25 51.1	52.8	9.163	55.93	1 44.49	15 59.62	1 4.69	1 8 14.69
10	1 13 39.24	39.46	7 48 9.5	10.8	9.174	55.60	1 27.98	15 59.35	1 4.72	1 12 11.24
11	1 17 19.54	19.73	+ 8 10 19.9	21.0	9.185	+ 55.27	+ 1 11.73	15 59.08	1 4.76	1 16 7.80
12	1 21 0.12	0.27	8 32 22.1	23.0	9.196	54.92	0 55.76	15 58.81	1 4.80	1 20 4.35
13	1 24 40.98	41.09	8 54 15.7	16.3	9.208	54.55	0 40.08	15 58.55	1 4.85	1 24 0.90
14	1 28 22.14	22.21	9 16 0.3	0.6	9.222	54.16	0 24.70	15 58.28	1 4.89	1 27 57.46
15	1 32 3.62	3.65	9 37 35.5	35.6	9.235	53.76	+ 0 9.62	15 58.02	1 4.94	1 31 54.01
16	1 35 45.43	45.42	+ 9 59 1.0	0.9	9.249	+ 53.35	- 0 5.13	15 57.76	1 4.99	1 35 50.57
17	1 39 27.58	27.53	10 20 16.5	16.2	9.263	52.93	0 19.53	15 57.50	1 5.05	1 39 47.12
18	1 43 10.09	10.01	10 41 21.7	21.3	9.279	52.50	0 33.58	15 57.24	1 5.11	1 43 43.68
19	1 46 52.98	52.87	11 2 16.3	15.7	9.295	52.05	0 47.25	15 56.98	1 5.17	1 47 40.23
20	1 50 36.26	36.11	11 22 59.9	59.1	9.312	51.58	1 0.52	15 56.72	1 5.23	1 51 36.78
21	1 54 19.94	19.76	+ 11 43 32.2	31.1	9.329	+ 51.10	- 1 13.38	15 56.47	1 5.29	1 55 33.34
22	1 58 4.05	3.84	12 3 52.8	51.5	9.347	50.61	1 25.82	15 56.22	1 5.35	1 59 29.89
23	2 1 48.60	48.35	12 24 1.4	0.1	9.366	50.10	1 37.82	15 55.97	1 5.42	2 3 26.45
24	2 5 33.60	33.32	12 43 57.9	56.4	9.385	49.59	1 49.37	15 55.72	1 5.49	2 7 23.00
25	2 9 19.07	18.76	13 3 41.9	40.2	9.404	49.06	2 0.46	15 55.47	1 5.56	2 11 19.56
26	2 13 5.02	4.68	+ 13 23 12.9	11.1	9.425	+ 48.51	- 2 11.06	15 55.21	1 5.63	2 15 16.11
27	2 16 51.47	51.11	13 42 30.8	29.0	9.446	47.96	2 21.16	15 54.96	1 5.70	2 19 12.67
28	2 20 38.44	38.05	14 1 35.3	33.4	9.468	47.40	2 30.76	15 54.71	1 5.77	2 23 9.22
29	2 24 25.92	25.50	14 20 26.1	24.1	9.490	46.82	2 39.83	15 54.46	1 5.84	2 27 5.78
30	2 28 13.93	13.49	14 39 2.8	0.7	9.512	46.22	2 48.37	15 54.21	1 5.92	2 31 2.33
May 1	2 32 2.48	2.02	+ 14 57 25.1	22.9	9.535	+ 45.62	- 2 56.38	15 53.97	1 6.00	2 34 58.89
2	2 35 51.59	51.11	15 15 32.8	30.5	9.558	45.01	3 3.83	15 53.72	1 6.07	2 38 55.44
3	2 39 41.27	40.77	15 33 25.4	23.1	9.582	44.38	3 10.71	15 53.48	1 6.15	2 42 52.00
4	2 43 31.51	31.00	15 51 2.8	0.5	9.605	43.74	3 17.02	15 53.24	1 6.23	2 46 48.56
5	2 47 22.32	21.79	16 8 24.6	22.3	9.629	43.08	3 22.77	15 53.01	1 6.31	2 50 45.11
6	2 51 13.71	13.16	+ 16 25 30.4	28.1	9.653	+ 42.40	- 3 27.94	15 52.78	1 6.39	2 54 41.67
7	2 55 5.67	5.11	16 42 19.9	17.5	9.677	41.71	3 32.53	15 52.55	1 6.47	2 58 38.22
8	2 58 58.21	57.63	16 58 52.8	50.4	9.701	41.01	3 36.55	15 52.33	1 6.55	3 2 34.78
9	3 2 51.32	50.73	17 15 8.8	6.4	9.725	40.30	3 39.99	15 52.11	1 6.63	3 6 31.33
10	3 6 45.00	44.41	17 31 7.4	5.0	9.749	39.58	3 42.86	15 51.89	1 6.71	3 10 27.89
11	3 10 39.25	38.66	+ 17 46 48.4	46.0	9.772	+ 38.83	- 3 45.17	15 51.68	1 6.79	3 14 24.45
12	3 14 34.07	33.47	18 2 11.5	9.1	9.796	38.08	3 46.92	15 51.48	1 6.88	3 18 21.00
13	3 18 29.45	28.84	18 17 16.4	14.1	9.819	37.32	3 48.11	15 51.28	1 6.97	3 22 17.56
14	3 22 25.38	24.76	18 32 2.8	0.5	9.842	36.55	3 48.74	15 51.08	1 7.06	3 26 14.11
15	3 26 21.86	21.24	18 46 30.3	28.0	9.865	35.75	3 48.81	15 50.88	1 7.14	3 30 10.67
16	3 30 18.89	18.27	+ 19 0 38.7	36.5	9.888	+ 34.94	- 3 48.33	15 50.69	1 7.22	3 34 7.23
17	3 34 16.47	15.85	+ 19 14 27.8	25.7	9.911	+ 34.13	- 3 47.31	15 50.50	1 7.30	3 38 3.78

NOTE.—For mean time interval of semidiameter passing meridian, subtract 05.18 from the sidereal interval.

[Eph 10]

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
May 17	3 34 16.47	15.85	+ 19 14 27.8	25.7	9.911	+ 34.13	- 3 47.31	15 50.50	1 7.30	3 38 3.78
18	3 38 14.59	13.98	19 27 57.3	55.2	9.934	33.30	3 45.75	15 50.32	1 7.38	3 42 0.34
19	3 42 13.26	12.65	19 41 6.9	4.9	9.956	32.47	3 43.64	15 50.14	1 7.46	3 45 56.90
20	3 46 12.48	11.87	19 53 56.4	54.5	9.979	31.63	3 40.99	15 49.96	1 7.54	3 49 53.46
21	3 50 12.23	11.63	20 6 25.5	23.7	10.001	30.78	3 37.80	15 49.78	1 7.62	3 53 50.01
22	3 54 12.51	11.91	+ 20 18 34.0	32.2	10.023	+ 29.92	- 3 34.08	15 49.60	1 7.70	3 57 46.57
23	3 58 13.31	12.72	20 30 21.6	19.9	10.045	29.04	3 29.84	15 49.42	1 7.77	4 1 43.13
24	4 2 14.63	14.06	20 41 48.2	46.6	10.067	28.16	3 25.07	15 49.25	1 7.83	4 5 39.68
25	4 6 16.47	15.92	20 52 53.5	52.1	10.088	27.27	3 19.78	15 49.08	1 7.90	4 9 36.24
26	4 10 18.82	18.28	21 3 37.4	36.1	10.108	26.37	3 13.99	15 48.91	1 7.97	4 13 32.80
27	4 14 21.66	21.13	+ 21 13 59.6	58.3	10.128	+ 25.46	- 3 7.71	15 48.75	1 8.04	4 17 29.36
28	4 18 24.98	24.47	21 23 59.8	58.6	10.149	24.53	3 0.94	15 48.60	1 8.11	4 21 25.91
29	4 22 28.79	28.30	21 33 37.9	36.8	10.169	23.61	2 53.69	15 48.45	1 8.17	4 25 22.47
30	4 26 33.08	32.61	21 42 53.7	52.7	10.188	22.68	2 45.96	15 48.29	1 8.23	4 29 19.03
31	4 30 37.83	37.39	21 51 47.0	46.1	10.207	21.74	2 37.78	15 48.14	1 8.29	4 33 15.59
June 1	4 34 43.01	42.60	+ 22 0 17.6	16.7	10.225	+ 20.79	- 2 29.15	15 47.99	1 8.35	4 37 12.15
2	4 38 48.62	48.23	22 8 25.3	24.5	10.243	19.83	2 20.09	15 47.84	1 8.41	4 41 8.70
3	4 42 54.65	54.28	22 16 9.9	9.3	10.260	18.86	2 10.61	15 47.70	1 8.47	4 45 5.26
4	4 47 1.07	0.73	22 23 31.2	30.7	10.275	17.89	2 0.74	15 47.56	1 8.52	4 49 1.82
5	4 51 7.87	7.56	22 30 29.0	28.6	10.290	16.91	1 50.51	15 47.43	1 8.57	4 52 58.38
6	4 55 15.01	14.73	+ 22 37 3.2	2.9	10.304	+ 15.93	- 1 39.93	15 47.31	1 8.61	4 56 54.94
7	4 59 22.47	22.23	22 43 13.8	13.5	10.317	14.94	1 29.02	15 47.20	1 8.66	5 0 51.49
8	5 3 30.24	30.03	22 49 0.5	0.2	10.329	13.93	1 17.80	15 47.09	1 8.70	5 4 48.05
9	5 7 38.28	38.10	22 54 23.1	22.8	10.340	12.92	1 6.31	15 46.98	1 8.74	5 8 44.60
10	5 11 46.57	46.42	22 59 21.4	21.1	10.351	11.91	0 54.58	15 46.88	1 8.77	5 12 41.16
11	5 15 55.09	54.97	+ 23 3 55.4	55.0	10.359	+ 10.90	- 0 42.63	15 46.78	1 8.80	5 16 37.72
12	5 20 3.81	3.73	23 8 5.0	4.8	10.367	9.88	0 30.48	15 46.70	1 8.83	5 20 34.28
13	5 24 12.71	12.66	23 11 50.2	50.1	10.374	8.86	0 18.15	15 46.60	1 8.86	5 24 30.84
14	5 28 21.76	21.74	23 15 10.8	10.8	10.379	7.83	- 0 5.67	15 46.52	1 8.88	5 28 27.40
15	5 32 30.92	30.94	23 18 6.7	6.7	10.384	6.80	+ 0 6.94	15 46.44	1 8.89	5 32 23.96
16	5 36 40.19	40.24	+ 23 20 38.0	38.0	10.388	+ 5.78	+ 0 19.67	15 46.36	1 8.91	5 36 20.52
17	5 40 49.54	49.63	23 22 44.6	44.6	10.391	4.75	0 32.48	15 46.29	1 8.92	5 40 17.07
18	5 44 58.97	59.10	23 24 26.4	26.4	10.393	3.72	0 45.36	15 46.23	1 8.93	5 44 13.63
19	5 49 8.45	8.62	23 25 43.3	43.3	10.395	2.69	0 58.28	15 46.17	1 8.94	5 48 10.19
20	5 53 17.95	18.16	23 26 35.4	35.4	10.396	1.65	1 11.22	15 46.11	1 8.94	5 52 6.75
21	5 57 27.46	27.70	+ 23 27 2.9	2.9	10.396	+ 0.62	+ 1 24.16	15 46.06	1 8.95	5 56 3.31
22	6 1 36.95	37.23	23 27 5.7	5.7	10.395	- 0.41	1 37.09	15 46.01	1 8.95	5 59 59.86
23	6 5 46.39	46.71	23 26 43.6	43.6	10.392	1.44	1 49.98	15 45.96	1 8.94	6 3 56.42
24	6 9 55.77	56.13	23 25 56.7	56.7	10.389	2.47	2 2.81	15 45.91	1 8.93	6 7 52.98
25	6 14 5.08	5.47	23 24 45.1	45.0	10.386	3.50	2 15.56	15 45.87	1 8.92	6 11 49.54
26	6 18 14.29	14.72	+ 23 23 8.8	8.7	10.381	- 4.53	+ 2 28.21	15 45.83	1 8.90	6 15 46.10
27	6 22 23.38	23.84	23 21 7.9	7.7	10.376	5.56	2 40.75	15 45.79	1 8.88	6 19 42.65
28	6 26 32.33	32.83	23 18 42.4	42.1	10.370	6.58	2 53.16	15 45.75	1 8.85	6 23 39.21
29	6 30 41.14	41.68	23 15 52.4	52.0	10.364	7.61	3 5.41	15 45.72	1 8.82	6 27 35.77
30	6 34 49.77	50.35	23 12 38.0	37.5	10.356	8.62	3 17.49	15 45.70	1 8.79	6 31 32.33
July 1	6 38 58.20	58.81	+ 23 8 59.2	58.6	10.347	- 9.63	+ 3 29.37	15 45.69	1 8.75	6 35 28.88

NOTE.—For mean time interval of semidiameter passing meridian, subtract 05.19 from the sidereal interval.

[Eph 10]

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.	
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.					
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s	
July	1	6 38 58.20	58.81	+23 8 59.2	58.6	10.347	-9.63	+3 29.37	15 45.69	I 8.75	6 35 28.88
	2	6 43 6.42	7.06	23 4 56.0	55.4	10.337	10.64	3 41.02	15 45.67	I 8.71	6 39 25.44
	3	6 47 14.39	15.06	23 0 28.6	27.9	10.326	11.65	3 52.42	15 45.66	I 8.68	6 43 22.00
	4	6 51 22.08	22.78	22 55 37.0	36.2	10.314	12.65	4 3.55	15 45.65	I 8.64	6 47 18.56
	5	6 55 29.46	30.19	22 50 21.5	20.5	10.301	13.65	4 14.38	15 45.65	I 8.60	6 51 15.12
	6	6 59 36.53	37.29	+22 44 42.1	40.9	10.287	-14.64	+4 24.90	15 45.66	I 8.56	6 55 11.68
	7	7 3 43.26	44.05	22 38 38.9	37.6	10.273	15.63	4 35.08	15 45.67	I 8.51	6 59 8.24
	8	7 7 49.62	50.43	22 32 12.1	10.8	10.257	16.61	4 44.88	15 45.69	I 8.46	7 3 4.79
	9	7 11 55.58	56.42	22 25 21.9	20.5	10.240	17.58	4 54.29	15 45.72	I 8.40	7 7 1.35
	10	7 16 1.13	1.99	22 18 8.5	6.9	10.222	18.55	5 3.28	15 45.75	I 8.34	7 10 57.91
	11	7 20 6.24	7.13	+22 10 32.0	30.3	10.203	-19.51	+5 11.83	15 45.79	I 8.28	7 14 54.47
	12	7 24 10.90	11.82	22 2 32.7	30.8	10.184	20.45	5 19.93	15 45.83	I 8.22	7 18 51.02
	13	7 28 15.10	16.03	21 54 10.6	8.6	10.165	21.39	5 27.56	15 45.87	I 8.16	7 22 47.58
	14	7 32 18.80	19.75	21 45 26.0	23.9	10.144	22.33	5 34.70	15 45.92	I 8.09	7 26 44.14
	15	7 36 22.00	22.97	21 36 19.1	16.9	10.122	23.25	5 41.34	15 45.97	I 8.02	7 30 40.70
	16	7 40 24.69	25.67	+21 26 50.1	47.8	10.101	-24.16	+5 47.47	15 46.03	I 7.95	7 34 37.26
	17	7 44 26.86	27.85	21 16 59.3	56.8	10.079	25.06	5 53.08	15 46.09	I 7.88	7 38 33.81
	18	7 48 28.50	29.50	21 6 46.9	44.2	10.057	25.96	5 58.16	15 46.15	I 7.81	7 42 30.37
	19	7 52 29.59	30.60	20 56 13.0	10.2	10.034	26.85	6 2.69	15 46.22	I 7.74	7 46 26.93
	20	7 56 30.13	31.15	20 45 18.1	15.2	10.011	27.73	6 6.67	15 46.30	I 7.65	7 50 23.49
	21	8 0 30.11	31.14	+20 33 62.3	59.3	9.987	-28.60	+6 10.09	15 46.38	I 7.57	7 54 20.05
	22	8 4 29.53	30.57	20 22 25.7	22.6	9.964	29.45	6 12.95	15 46.46	I 7.49	7 58 16.60
	23	8 8 28.38	29.43	20 10 28.5	25.3	9.940	30.30	6 15.24	15 46.54	I 7.41	8 2 13.16
	24	8 12 26.67	27.71	19 58 11.2	7.9	9.917	31.14	6 16.97	15 46.62	I 7.32	8 6 9.72
	25	8 16 24.38	25.42	19 45 34.0	30.6	9.893	31.97	6 18.13	15 46.71	I 7.24	8 10 6.27
	26	8 20 21.52	22.56	+19 32 37.1	33.5	9.869	-32.79	+6 18.72	15 46.80	I 7.16	8 14 2.83
	27	8 24 18.09	19.12	19 19 20.6	17.0	9.845	33.59	6 18.73	15 46.90	I 7.08	8 17 59.39
	28	8 28 14.07	15.11	19 5 44.9	41.2	9.821	34.39	6 18.15	15 47.00	I 6.99	8 21 55.94
	29	8 32 9.48	10.52	18 51 50.2	46.4	9.797	35.17	6 16.99	15 47.10	I 6.91	8 25 52.50
	30	8 36 4.32	5.35	18 37 36.7	32.8	9.773	35.94	6 15.26	15 47.20	I 6.82	8 29 49.06
	31	8 39 58.57	59.59	+18 23 4.7	0.9	9.749	-36.70	+6 12.95	15 47.31	I 6.73	8 33 45.61
Aug.	1	8 43 52.23	53.24	18 8 14.7	10.9	9.724	37.46	6 10.05	15 47.43	I 6.64	8 37 42.17
	2	8 47 45.30	46.30	17 53 6.9	3.0	9.699	38.20	6 6.56	15 47.55	I 6.55	8 41 38.73
	3	8 51 37.77	38.76	17 37 41.5	37.5	9.674	38.93	6 2.48	15 47.68	I 6.46	8 45 35.29
	4	8 55 29.64	30.62	17 21 58.7	54.7	9.649	39.64	5 57.80	15 47.81	I 6.37	8 49 31.84
	5	8 59 20.91	21.87	+17 5 58.9	54.9	9.624	-40.34	+5 52.51	15 47.95	I 6.29	8 53 28.39
	6	9 3 11.59	12.52	16 49 42.6	38.6	9.599	41.03	5 46.62	15 48.09	I 6.20	8 57 24.95
	7	9 7 1.66	2.57	16 33 9.9	5.9	9.574	41.71	5 40.14	15 48.23	I 6.12	9 1 21.51
	8	9 10 51.13	52.02	16 16 21.2	17.2	9.549	42.36	5 33.06	15 48.38	I 6.03	9 5 18.06
	9	9 14 40.00	40.87	15 59 16.7	12.8	9.524	43.00	5 25.37	15 48.54	I 5.95	9 9 14.62
	10	9 18 28.27	29.12	+15 41 56.8	53.0	9.499	-43.63	+5 17.08	15 48.70	I 5.86	9 13 11.17
	11	9 22 15.95	16.77	15 24 22.0	18.2	9.474	44.26	5 8.20	15 48.86	I 5.78	9 17 7.73
	12	9 26 3.05	4.84	15 6 32.4	28.7	9.450	44.87	4 58.74	15 49.03	I 5.70	9 21 4.29
	13	9 29 49.57	50.32	14 48 28.3	24.7	9.426	45.47	4 48.70	15 49.21	I 5.62	9 25 0.84
	14	9 33 35.52	36.24	14 30 10.1	6.5	9.403	46.05	4 38.10	15 49.38	I 5.54	9 28 57.40
	15	9 37 20.91	21.62	+14 11 38.2	34.6	9.380	-46.61	+4 26.94	15 49.56	I 5.46	9 32 53.95
	16	9 41 5.75	6.43	+13 52 52.9	49.4	9.357	-47.17	+4 15.23	15 49.74	I 5.38	9 36 50.51

NOTE.—For mean time interval of semidiameter passing meridian, subtract 05.18 from the sidereal interval.

[Eph 10]

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
h m s	s	° ' "	"	s	"	m s	"	m s	h m s	
Aug. 16	9 41 5-75	6.43	+ 13 52 52.9	49.4	9-357	-47-17	+ 4 15-23	15 49-74	1 5-38	9 36 50.51
17	9 44 50.05	50.70	13 33 54.4	51.0	9-334	47-21	4 2-98	15 49-93	1 5-31	9 40 47.06
18	9 48 33.83	34.44	13 14 43.0	39.8	9-312	48-23	3 50-20	15 50-12	1 5-24	9 44 43.62
19	9 52 17.10	17.67	12 55 19.1	16.0	9-292	48-25	3 36-91	15 50-31	1 5-17	9 48 40.17
20	9 55 59.87	60.40	12 35 42.9	40.0	9-272	49-26	3 23-12	15 50-50	1 5-10	9 52 36.73
21	9 59 42.16	42.65	+ 12 15 54.7	52.0	9-252	-49-26	+ 3 8-85	15 50-69	1 5-03	9 56 33.28
22	10 3 23.99	24.44	11 55 54.9	52.4	9-233	50-23	2 54-13	15 50-88	1 4-96	10 0 29.84
23	10 7 5-38	5-79	11 35 43.8	41.5	9-215	50-20	2 38-97	15 51-08	1 4-90	10 4 26.39
24	10 10 46.33	46.71	11 15 21.6	19.5	9-197	51-15	2 23-38	15 51-28	1 4-83	10 8 22.95
25	10 14 26.87	27.21	10 54 48.6	46.6	9-180	51-60	2 7-37	15 51-48	1 4-77	10 12 19.50
26	10 18 7-02	7-31	+ 10 34 5-1	3-4	9-164	-52-02	+ 1 50-96	15 51-68	1 4-71	10 16 16.05
27	10 21 46.79	47.04	10 13 11.5	10.1	9-149	52-44	1 34-17	15 51-89	1 4-65	10 20 12.61
28	10 25 26.19	26.40	9 52 8-0	6-9	9-134	52-84	1 17-02	15 52-10	1 4-59	10 24 9-16
29	10 29 5-25	5-41	9 30 54-9	54-0	9-120	53-23	0 59-53	15 52-31	1 4-54	10 28 5-72
30	10 32 43-97	44-09	9 9 32-6	32-0	9-106	53-61	0 41-70	15 52-52	1 4-49	10 32 2-27
31	10 36 22-37	22-44	+ 8 48 1-4	1-0	9-093	-53-98	+ 0 23-55	15 52-74	1 4-44	10 35 58-82
Sept. 1	10 40 0-45	0-47	8 26 21-7	21-5	9-080	54-32	+ 0 5-08	15 52-97	1 4-39	10 39 55-38
2	10 43 38-23	38-20	8 4 33-7	33-8	9-068	54-66	- 0 13-69	15 53-20	1 4-34	10 43 51-93
3	10 47 15-73	15-65	7 42 37-9	38-3	9-057	54-98	0 32-75	15 53-43	1 4-30	10 47 48-49
4	10 50 52-96	52-83	7 20 34-5	35-3	9-046	55-28	0 52-07	15 53-66	1 4-26	10 51 45-04
5	10 54 29-93	29-75	+ 6 58 24-0	25-1	9-035	-55-57	- 1 11-64	15 53-90	1 4-22	10 55 41-60
6	10 58 6-65	6-43	6 36 6-7	8-0	9-025	55-86	1 31-45	15 54-14	1 4-19	10 59 38-15
7	11 1 43-15	42-88	6 13 42-8	44-4	9-015	56-13	1 51-49	15 54-39	1 4-16	11 3 34-70
8	11 5 19-45	19-13	5 51 12-7	14-7	9-007	56-37	2 11-75	15 54-64	1 4-13	11 7 31-26
9	11 8 55-55	55-18	5 28 36-9	39-3	9-000	56-61	2 32-21	15 54-89	1 4-10	11 11 27-81
10	11 12 31-48	31-06	+ 5 5 55-7	58-4	8-994	-56-83	- 2 52-85	15 55-14	1 4-08	11 15 24-36
11	11 16 7-25	6-77	4 43 9-4	12-4	8-988	57-03	3 13-64	15 55-40	1 4-07	11 19 20-92
12	11 19 42-88	42-34	4 20 18-4	21-7	8-983	57-22	3 34-55	15 55-65	1 4-05	11 23 17-47
13	11 23 18-39	17-79	3 57 22-9	26-5	8-978	57-40	3 55-58	15 55-91	1 4-04	11 27 14-02
14	11 26 53-80	53-15	3 34 23-2	27-2	8-974	57-57	4 16-72	15 56-17	1 4-03	11 31 10-58
15	11 30 29-13	28-43	+ 3 11 19-8	24-2	8-971	-57-72	- 4 37-94	15 56-43	1 4-02	11 35 7-13
16	11 34 4-39	3-65	2 48 13-1	17-8	8-969	57-85	4 59-21	15 56-69	1 4-01	11 39 3-68
17	11 37 39-62	38-83	2 25 3-2	8-3	8-968	57-98	5 20-51	15 56-96	1 4-01	11 43 0-24
18	11 41 14-85	14-01	2 1 50-3	55-8	8-968	58-08	5 41-83	15 57-23	1 4-01	11 46 56-79
19	11 44 50-10	49-20	1 38 34-9	40-8	8-969	58-18	6 3-14	15 57-50	1 4-01	11 50 53-34
20	11 48 25-38	24-43	+ 1 15 17-5	23-6	8-972	-58-27	- 6 24-41	15 57-76	1 4-02	11 54 49-90
21	11 51 60-73	59-72	0 51 58-2	64-6	8-975	58-35	6 45-61	15 58-02	1 4-03	11 58 46-45
22	11 55 36-17	35-10	0 28 37-2	44-0	8-979	58-41	7 6-73	15 58-29	1 4-04	12 2 43-00
23	11 59 11-71	10-59	+ 0 5 14-8	22-0	8-984	58-45	7 27-74	15 58-56	1 4-05	12 6 39-56
24	12 2 47-38	46-20	- 0 18 8-6	1-1	8-989	58-49	7 48-62	15 58-82	1 4-07	12 10 36-11
25	12 6 23-20	21-97	- 0 41 32-6	24-8	8-996	-58-50	- 8 9-34	15 59-08	1 4-10	12 14 32-66
26	12 9 59-20	57-93	1 4 56-8	48-7	9-004	58-51	8 29-88	15 59-34	1 4-13	12 18 29-22
27	12 13 35-41	34-09	1 28 21-0	12-6	9-013	58-50	8 50-23	15 59-61	1 4-16	12 22 25-77
28	12 17 11-83	10-46	1 51 45-0	36-2	9-022	58-48	9 10-37	15 59-88	1 4-19	12 26 22-33
29	12 20 48-48	47-06	2 14 68-2	59-0	9-033	58-44	9 30-27	16 0-15	1 4-22	12 30 18-88
30	12 24 25-39	23-91	- 2 38 30-2	20-7	9-044	-58-39	- 9 49-92	16 0-42	1 4-26	12 34 15-43
Oct. 1	12 28 2-57	1-03	- 3 1 50-7	40-9	9-055	-58-32	- 10 9-30	16 0-70	1 4-30	12 38 11-98

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

[Eph 10]

## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	"	m s	h m s
Oct. 1	12 28 2.57	1.03	3 15 0.7	40.9	9.055	-58.32	10 9.30	16 0.70	1 4.30	12 38 11.98
2	12 31 40.03	38.44	3 24 69.4	59.4	9.068	58.23	10 28.39	16 0.97	1 4.34	12 42 8.54
3	12 35 17.78	16.15	3 48 25.9	15.6	9.080	58.13	10 47.18	16 1.24	1 4.38	12 46 5.09
4	12 38 55.85	54.18	4 11 39.8	29.2	9.093	58.02	11 5.65	16 1.52	1 4.43	12 50 1.65
5	12 42 34.26	32.55	4 34 50.7	39.7	9.108	57.88	11 23.78	16 1.80	1 4.48	12 53 58.20
6	12 46 13.03	11.27	4 57 58.1	46.8	9.123	-57.73	11 41.56	16 2.07	1 4.54	12 57 54.75
7	12 49 52.18	50.36	5 20 61.7	50.3	9.139	57.57	11 58.97	16 2.35	1 4.60	13 1 51.30
8	12 53 31.71	29.84	5 43 61.3	49.7	9.156	57.38	12 16.00	16 2.63	1 4.66	13 5 47.86
9	12 57 11.65	9.73	6 6 56.3	44.4	9.173	57.19	12 32.62	16 2.92	1 4.72	13 9 44.41
10	13 0 52.02	50.05	6 29 46.3	34.2	9.191	56.98	12 48.81	16 3.20	1 4.79	13 13 40.97
11	13 4 32.83	30.82	6 52 31.1	18.7	9.210	-56.74	13 4.55	16 3.48	1 4.86	13 17 37.52
12	13 8 14.10	12.05	7 15 10.1	57.6	9.229	56.49	13 19.83	16 3.77	1 4.93	13 21 34.07
13	13 11 55.85	53.76	7 37 43.1	30.4	9.250	56.23	13 34.64	16 4.05	1 5.01	13 25 30.63
14	13 15 38.10	35.97	7 59 69.8	56.9	9.272	55.96	13 48.94	16 4.33	1 5.09	13 29 27.18
15	13 19 20.88	18.71	8 22 29.7	16.7	9.294	55.67	14 2.72	16 4.61	1 5.17	13 33 23.74
16	13 23 4.20	1.99	8 44 42.3	29.2	9.317	-55.36	14 15.96	16 4.89	1 5.25	13 37 20.29
17	13 26 48.07	45.82	9 6 47.4	34.2	9.341	55.04	14 28.65	16 5.16	1 5.33	13 41 16.85
18	13 30 32.53	30.24	9 28 44.6	31.3	9.365	54.71	14 40.76	16 5.44	1 5.42	13 45 13.40
19	13 34 17.60	15.26	9 50 33.6	20.1	9.391	54.36	14 52.25	16 5.71	1 5.51	13 49 9.95
20	13 38 3.29	0.91	10 12 14.0	0.4	9.418	53.99	15 3.11	16 5.98	1 5.60	13 53 6.51
21	13 41 49.62	47.22	10 33 45.4	31.8	9.445	-53.61	15 13.33	16 6.24	1 5.69	13 57 3.06
22	13 45 36.63	34.20	10 54 67.6	54.0	9.473	53.22	15 22.88	16 6.51	1 5.79	14 0 59.62
23	13 49 24.32	21.86	11 16 20.2	6.6	9.502	52.81	15 31.75	16 6.77	1 5.89	14 4 56.17
24	13 53 12.71	10.22	11 37 22.8	9.2	9.531	52.39	15 39.92	16 7.03	1 5.99	14 8 52.72
25	13 56 61.82	59.31	11 58 14.9	1.2	9.561	51.95	15 47.38	16 7.28	1 6.09	14 12 49.28
26	14 0 51.66	49.13	12 18 56.1	42.3	9.591	-51.48	15 54.10	16 7.54	1 6.20	14 16 45.83
27	14 4 42.25	39.69	12 39 26.0	12.3	9.622	51.00	16 0.07	16 7.80	1 6.30	14 20 42.38
28	14 8 33.59	31.01	12 59 44.3	30.8	9.654	50.51	16 5.28	16 8.05	1 6.41	14 24 38.94
29	14 12 25.70	23.10	13 19 50.5	37.1	9.687	50.00	16 9.73	16 8.30	1 6.52	14 28 35.50
30	14 16 18.58	15.97	13 39 44.1	30.7	9.720	49.47	16 13.42	16 8.55	1 6.63	14 32 32.05
31	14 20 12.24	9.62	13 59 24.8	11.5	9.752	-48.93	16 16.32	16 8.80	1 6.74	14 36 28.61
Nov. 1	14 24 6.69	4.05	14 18 52.2	39.1	9.785	48.36	16 18.43	16 9.05	1 6.85	14 40 25.17
2	14 27 61.94	59.28	14 37 65.9	53.0	9.818	47.77	16 19.75	16 9.30	1 6.97	14 44 21.72
3	14 31 58.00	55.33	14 56 65.4	52.6	9.852	47.17	16 20.26	16 9.54	1 7.09	14 48 18.28
4	14 35 54.87	52.19	15 15 50.1	37.4	9.886	46.55	16 19.96	16 9.79	1 7.20	14 52 14.83
5	14 39 52.55	49.86	15 34 19.6	7.1	9.920	-45.91	16 18.85	16 10.04	1 7.32	14 56 11.39
6	14 43 51.04	48.34	15 52 33.6	21.4	9.954	45.25	16 16.92	16 10.29	1 7.44	15 0 7.94
7	14 47 50.35	47.65	16 10 31.7	19.8	9.988	44.58	16 14.18	16 10.53	1 7.56	15 4 4.50
8	14 51 50.48	47.79	16 28 13.6	1.8	10.022	43.89	16 10.61	16 10.77	1 7.68	15 8 1.05
9	14 55 51.44	48.75	16 45 38.7	27.1	10.057	43.18	16 6.23	16 11.01	1 7.80	15 11 57.61
10	14 59 53.22	50.54	17 2 46.5	35.2	10.092	-42.45	16 1.01	16 11.24	1 7.92	15 15 54.17
11	15 3 55.83	53.16	17 19 36.8	25.8	10.127	41.71	15 54.95	16 11.47	1 8.04	15 19 50.72
12	15 7 59.28	56.62	17 35 69.2	58.4	10.161	40.96	15 48.07	16 11.70	1 8.16	15 23 47.28
13	15 12 3.56	0.91	17 52 23.2	12.8	10.195	40.19	15 40.36	16 11.93	1 8.28	15 27 43.84
14	15 16 8.67	6.03	18 8 18.5	8.3	10.230	39.40	15 31.82	16 12.16	1 8.40	15 31 40.40
15	15 20 14.61	11.99	18 23 54.7	44.8	10.265	-38.60	15 22.44	16 12.38	1 8.52	15 35 36.95
16	15 24 21.39	18.79	18 39 11.5	1.9	10.299	-37.78	15 12.22	16 12.59	1 8.64	15 39 33.51

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0<sup>s</sup>.18 from the sidereal interval.

[Eph 10]



## FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Meridian.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ' "	"	s	"	m s	' "	m s	h m s
Nov. 16	15 24 21.39	18.79	-18 39 11.5	1.9	10.299	-37.78	-15 12.22	16 12.59	1 8.64	15 39 33.51
17	15 28 29.01	26.44	-18 53 68.5	59.2	10.334	36.95	15 1.16	16 12.79	1 8.75	15 43 30.07
18	15 32 37.47	34.93	-19 8 45.3	36.3	10.369	36.10	14 49.26	16 13.00	1 8.87	15 47 26.62
19	15 36 46.78	44.26	-19 22 61.5	52.9	10.404	35.24	14 36.53	16 13.20	1 8.98	15 51 23.18
20	15 40 56.92	54.43	-19 36 56.7	48.5	10.438	34.35	14 22.96	16 13.39	1 9.09	15 55 19.73
21	15 45 7.89	5.44	-19 50 30.7	22.9	10.473	-33.46	-14 8.55	16 13.58	1 9.20	15 59 16.29
22	15 49 19.68	17.27	-20 3 43.2	35.8	10.507	32.56	13 53.32	16 13.77	1 9.31	16 3 12.85
23	15 53 32.29	29.92	-20 16 33.8	26.8	10.542	31.64	13 37.27	16 13.95	1 9.42	16 7 9.41
24	15 57 45.70	43.37	-20 28 62.1	55.4	10.575	30.70	13 20.42	16 14.13	1 9.53	16 11 5.97
25	16 1 59.90	57.62	-20 41 7.7	1.3	10.608	29.75	13 2.77	16 14.30	1 9.63	16 15 2.52
26	16 6 14.88	12.65	-20 52 50.2	44.1	10.640	-28.78	-12 44.34	16 14.47	1 9.73	16 18 59.08
27	16 10 30.62	28.44	-21 4 9.3	3.5	10.672	27.80	12 25.16	16 14.63	1 9.83	16 22 55.64
28	16 14 47.11	44.97	-21 14 64.7	59.3	10.702	26.81	12 5.24	16 14.79	1 9.93	16 26 52.19
29	16 19 4.32	2.23	-21 25 36.1	31.0	10.731	25.80	11 44.59	16 14.95	1 10.03	16 30 48.75
30	16 23 22.22	20.19	-21 35 43.1	38.4	10.759	24.77	11 23.24	16 15.11	1 10.12	16 34 45.31
Dec. 1	16 27 40.81	38.84	-21 45 25.5	21.2	10.788	-23.74	-11 1.22	16 15.26	1 10.21	16 38 41.87
2	16 31 60.04	58.14	-21 54 42.8	38.9	10.815	22.69	10 38.56	16 15.42	1 10.30	16 42 38.43
3	16 36 19.90	18.07	-22 3 34.8	31.2	10.840	21.62	10 15.27	16 15.57	1 10.39	16 46 34.99
4	16 40 40.36	38.59	-22 11 61.2	57.9	10.864	20.55	9 51.36	16 15.72	1 10.47	16 50 31.55
5	16 44 61.40	59.70	-22 19 61.8	58.7	10.888	19.47	9 26.86	16 15.86	1 10.55	16 54 28.10
6	16 49 22.98	21.36	-22 27 36.3	33.5	10.911	-18.38	-9 1.82	16 16.00	1 10.62	16 58 24.66
7	16 53 45.08	43.54	-22 34 44.4	42.0	10.931	17.28	8 36.27	16 16.14	1 10.68	17 2.21.22
8	16 58 7.69	6.21	-22 41 26.0	23.9	10.951	16.17	8 10.24	16 16.27	1 10.75	17 6 17.78
9	17 2 30.75	29.34	-22 47 40.8	38.9	10.970	15.05	7 43.74	16 16.40	1 10.82	17 10 14.34
10	17 6 54.23	52.90	-22 53 28.6	26.9	10.987	13.92	7 16.81	16 16.52	1 10.88	17 14 10.90
11	17 11 18.11	16.86	-22 58 49.3	47.8	11.003	-12.79	-6 49.47	16 16.64	1 10.94	17 18 7.45
12	17 15 42.37	41.20	-23 3 42.7	41.4	11.018	11.65	6 21.77	16 16.76	1 10.99	17 22 4.01
13	17 20 6.97	5.89	-23 8 8.6	7.5	11.032	10.49	5 53.72	16 16.86	1 11.04	17 26 0.57
14	17 24 31.88	30.89	-23 12 6.9	6.1	11.045	9.34	5 25.35	16 16.96	1 11.08	17 29 57.13
15	17 28 57.08	56.18	-23 15 37.5	36.9	11.056	8.18	4 56.69	16 17.05	1 11.12	17 33 53.69
16	17 33 22.55	21.73	-23 18 40.3	39.8	11.066	-7.02	-4 27.77	16 17.14	1 11.15	17 37 50.25
17	17 37 48.25	47.53	-23 21 15.2	14.8	11.076	5.86	3 58.62	16 17.23	1 11.18	17 41 46.81
18	17 42 14.16	13.53	-23 23 22.1	21.8	11.084	4.70	3 29.26	16 17.31	1 11.21	17 45 43.37
19	17 46 40.25	39.70	-23 25 0.9	0.7	11.090	3.53	2 59.72	16 17.37	1 11.23	17 49 39.92
20	17 51 6.49	6.03	-23 26 11.5	11.5	11.096	2.35	2 30.03	16 17.43	1 11.24	17 53 36.48
21	17 55 32.85	32.48	-23 26 54.0	54.0	11.101	-1.17	-2 0.23	16 17.49	1 11.25	17 57 33.04
22	17 59 59.29	59.02	-23 27 8.3	8.3	11.104	0.00	1 30.34	16 17.55	1 11.26	18 1 29.60
23	18 4 25.78	25.60	-23 26 54.4	54.4	11.104	+ 1.17	1 0.40	16 17.60	1 11.26	18 5 26.16
24	18 8 52.29	52.20	-23 26 12.1	12.1	11.104	2.35	0 30.44	16 17.64	1 11.26	18 9 22.72
25	18 13 18.79	18.79	-23 25 1.6	1.5	11.102	3.53	-0 0.49	16 17.68	1 11.25	18 13 19.28
26	18 17 45.23	45.33	-23 23 22.9	22.8	11.099	+ 4.71	+ 0 29.41	16 17.71	1 11.24	18 17 15.84
27	18 22 11.57	11.76	-23 21 15.9	15.8	11.095	5.88	0 59.21	16 17.74	1 11.23	18 21 12.39
28	18 26 37.78	38.06	-23 18 40.7	40.5	11.089	7.05	1 28.88	16 17.77	1 11.21	18 25 8.95
29	18 31 3.84	4.20	-23 15 37.3	37.0	11.081	8.22	1 58.39	16 17.78	1 11.18	18 29 5.51
30	18 35 29.70	30.15	-23 12 6.0	5.5	11.072	9.39	2 27.69	16 17.80	1 11.14	18 33 2.07
31	18 39 55.32	55.86	-23 8 6.8	6.3	11.062	+ 10.55	+ 2 56.76	16 17.81	1 11.10	18 36 58.63
32	18 44 20.67	21.30	-23 3 40.0	39.4	11.050	+ 11.71	+ 3 25.55	16 17.82	1 11.06	18 40 55.19

NOTE.—For mean time interval of semidiameter passing meridian, subtract 06.19 from the sidereal interval.

[Eph 10]

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi- diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Jan. 1	17 19.01	1.687	12 3 43.48	111.36	+ 4 51 31.3	- 793.4	61.59	14 52.8	54 30.7	II. S.
2	17 59.03	1.656	12 47 47.92	109.49	- 0 27 31.8	798.0	61.06	14 48.9	54 16.4	II. S.
3	18 38.87	1.672	13 31 41.41	110.44	5 43 48.9	779.7	61.32	14 48.0	54 13.3	II. S.
4	19 19.64	1.733	14 16 30.81	114.14	10 48 13.1	738.0	62.33	14 50.2	54 21.2	II. S.
5	20 2.40	1.836	15 3 19.71	120.35	15 30 30.2	668.2	64.00	14 55.2	54 39.4	II. S.
6	20 48.07	1.974	15 53 4.03	128.62	- 19 38 11.2	- 563.7	66.16	15 2.5	55 6.4	II. S.
7	21 37.29	2.129	16 46 22.29	137.95	22 55 58.1	417.7	68.53	15 11.7	55 40.2	II. S.
8	22 30.16	2.272	17 43 19.91	146.56	25 6 31.2	227.8	70.65	15 22.1	56 18.2	II. N.
9	23 25.98	2.368	18 43 14.68	152.35	25 53 20.0	- 1.3	72.04	15 32.8	56 57.4	
11	0 23.26	2.391	19 44 37.32	153.74	25 5 18.7	+ 242.1	72.38	15 43.0	57 34.8	
12	1 20.18	2.341	20 45 38.64	150.73	22 41 1.3	+ 475.3	71.66	15 51.9	58 7.8	I. S.
13	2 15.29	2.216	21 44 50.75	145.00	18 49 42.8	673.8	70.28	15 59.2	58 34.5	I. S.
14	3 7.94	2.143	22 41 34.95	138.77	13 48 38.6	822.7	68.77	16 4.5	58 54.0	I. S.
15	3 58.34	2.062	23 36 3.45	133.95	7 58 53.5	917.0	67.58	16 7.9	59 6.5	I. S.
16	4 47.28	2.024	0 29 4.77	131.63	- 1 42 15.5	957.3	67.02	16 9.6	59 12.6	I. S.
17	5 35.90	2.036	1 21 46.58	132.36	+ 4 40 1.2	+ 945.4	67.25	16 9.8	59 13.3	I. S.
18	6 25.42	2.098	2 15 22.15	136.08	10 47 5.2	881.0	68.23	16 8.7	59 9.1	I. S.
19	7 16.93	2.200	3 10 57.73	142.21	16 17 48.0	763.4	69.76	16 6.3	59 0.4	I. S.
20	8 11.15	2.319	4 9 16.76	149.38	20 50 31.0	591.4	71.52	16 2.6	58 47.0	I. S.
21	9 8.11	2.420	5 10 19.82	155.46	24 4 29.3	371.4	72.95	15 57.6	58 28.6	I. S.
22	10 6.83	2.461	6 13 9.71	157.92	+ 25 43 30.4	+ 120.6	73.47	15 51.1	58 4.8	I. N.
23	11 5.55	2.418	7 15 58.82	155.30	25 40 35.1	- 133.0	72.78	15 43.3	57 36.0	I. N.
24	12 2.26	2.298	8 16 47.17	148.12	24 0 38.7	360.0	70.99	15 34.3	57 3.0	I. II. N.
25	12 55.52	2.137	9 14 8.16	138.44	20 58 41.8	541.1	68.55	15 24.6	56 27.5	II. N. S.
26	13 44.82	1.974	10 7 30.78	128.58	16 54 43.2	670.4	66.03	15 14.9	55 51.8	II. S.
27	14 30.44	1.834	10 57 12.37	120.22	+ 12 8 43.6	- 752.4	63.83	15 5.8	55 18.3	II. S.
28	15 13.17	1.734	11 43 59.80	114.16	6 58 0.5	795.5	62.22	14 57.9	54 49.6	II. S.
29	15 54.01	1.677	12 28 53.23	110.75	+ 1 36 30.0	807.5	61.32	14 52.0	54 28.0	II. S.
30	16 34.02	1.665	13 12 57.04	110.03	- 3 44 35.4	793.9	61.18	14 48.6	54 15.3	II. S.
31	17 14.29	1.698	13 57 16.14	112.02	8 55 33.5	756.9	61.79	14 48.0	54 13.0	II. S.
Feb 1	17 55.86	1.774	14 42 54.19	116.60	- 13 46 53.8	- 695.2	63.09	14 50.3	54 21.6	II. S.
2	18 39.75	1.889	15 30 51.15	123.53	18 7 57.7	604.6	64.99	14 55.7	54 41.3	II. S.
3	19 26.78	2.034	16 21 57.38	132.21	21 45 55.6	478.7	67.27	15 3.9	55 11.5	II. S.
4	20 17.44	2.187	17 16 41.83	141.45	24 25 26.7	311.9	69.61	15 14.6	55 50.9	II. S.
5	21 11.60	2.319	18 14 56.48	149.36	25 49 49.7	- 103.9	71.52	15 27.2	56 36.9	II. N.
6	22 8.31	2.396	19 15 45.23	153.99	- 25 44 15.6	+ 135.2	72.58	15 40.6	57 26.1	II. N.
7	23 6.00	2.399	20 17 32.48	154.19	24 0 31.3	382.5	72.58	15 53.7	58 14.4	
9	0 2.96	2.339	21 18 35.93	150.58	20 40 45.3	610.6	71.67	16 5.4	58 57.2	
10	0 58.01	2.247	22 17 44.74	145.02	15 57 51.5	794.9	70.29	16 14.4	59 30.3	
11	1 50.82	2.158	23 14 38.65	139.66	10 12 34.5	920.9	68.97	16 20.1	59 51.2	I. S.
12	2 41.81	2.098	0 9 42.96	136.08	- 3 49 30.1	+ 983.6	68.11	16 22.2	59 58.8	I. S.
13	3 31.88	2.082	1 3 51.89	135.14	+ 2 46 3.7	984.0	67.93	16 20.9	59 53.9	I. S.
14	4 22.13	2.113	1 58 11.80	136.98	9 9 43.3	924.8	68.47	16 16.7	59 38.8	I. S.
15	5 13.63	2.184	2 53 46.70	141.25	14 58 30.4	810.1	69.61	16 10.5	59 16.1	I. S.
16	6 7.15	2.278	3 51 23.45	146.90	+ 19 50 55.7	+ 643.9	71.05	16 3.1	58 48.8	I. S.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi- diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Feb. 16	6 7.15	2.278	3 51 23.45	146.90	+ 19 50 55.7	+ 643.9	71.05	16 3.1	58 48.8	I. S.
17	7 2.92	2.365	4 51 15.07	152.16	23 27 42.8	433.7	72.34	15 55.0	58 19.0	I. S.
18	8 0.35	2.411	5 52 46.84	154.91	25 33 50.9	+ 193.7	72.96	15 46.6	57 48.1	I. N. S.
19	8 58.10	2.389	6 54 37.68	153.59	26 1 37.7	- 53.9	72.56	15 38.1	57 17.1	I. N.
20	9 54.46	2.298	7 55 5.28	148.10	24 52 57.8	284.5	71.14	15 29.8	56 46.5	I. N.
21	10 48.02	2.160	8 52 44.12	139.84	+ 22 18 54.4	- 478.4	68.99	15 21.6	56 16.4	I. N.
22	11 38.05	2.010	9 46 51.12	130.77	18 36 20.0	626.4	66.60	15 13.6	55 47.2	I. N.
23	12 24.60	1.873	10 37 27.88	122.53	14 3 53.9	728.3	64.39	15 6.1	55 19.6	II. N.
24	13 8.20	1.766	11 25 7.54	116.13	8 59 11.1	788.9	62.66	14 59.3	54 54.5	II. N. S.
25	13 49.68	1.698	12 10 40.21	112.01	+ 3 37 26.7	814.4	61.54	14 53.5	54 33.3	II. S.
26	14 30.01	1.669	12 55 2.81	110.30	- 1 48 25.5	- 810.3	61.12	14 49.1	54 17.3	II. S.
27	15 10.14	1.682	13 39 14.12	111.05	7 7 18.6	779.8	61.40	14 46.6	54 8.2	II. S.
28	15 51.06	1.734	14 24 12.42	114.20	12 8 58.2	724.1	62.37	14 46.5	54 7.6	II. S.
Mar. 1	16 33.69	1.824	15 10 53.70	119.59	16 43 1.6	641.4	63.93	14 48.9	54 16.5	II. S.
2	17 18.86	1.944	16 0 7.77	126.84	20 38 2.2	528.1	65.94	14 54.2	54 35.9	II. S.
3	18 7.17	2.083	16 52 30.85	135.17	- 23 40 53.0	- 380.0	68.16	15 2.4	55 6.1	II. S.
4	18 58.80	2.217	17 48 13.91	143.24	25 36 57.7	- 194.3	70.23	15 13.5	55 46.6	II. S.
5	19 53.33	2.319	18 46 51.07	149.38	26 11 48.3	+ 25.0	71.72	15 26.9	56 35.9	II. N.
6	20 49.68	2.366	19 47 17.77	152.21	25 14 12.1	265.0	72.36	15 42.0	57 31.2	II. N.
7	21 46.42	2.353	20 48 7.89	151.40	22 39 55.5	504.2	72.09	15 57.6	58 28.4	II. N.
8	22 42.26	2.296	21 48 4.41	148.01	- 18 34 8.2	+ 718.5	71.18	16 12.2	59 22.2	II. N.
9	23 36.53	2.227	22 46 26.16	143.83	13 11 15.8	886.7	70.10	16 24.4	60 6.8	
11	0 29.27	2.173	23 43 15.60	140.56	6 52 59.8	993.7	69.27	16 32.7	60 37.2	
12	1 21.09	2.153	0 39 9.95	139.37	- 0 5 33.4	1031.7	68.99	16 36.2	60 50.1	I. S.
13	2 12.94	2.175	1 35 5.82	140.71	+ 6 42 50.0	998.5	69.38	16 34.6	60 44.4	I. S.
14	3 5.80	2.236	2 32 2.94	144.38	+ 13 4 0.4	+ 896.4	70.37	16 28.6	60 22.3	I. S.
15	4 0.45	2.320	3 30 47.26	149.43	18 31 36.2	732.0	71.70	16 19.2	59 47.8	I. S.
16	4 57.11	2.398	4 31 32.85	154.15	22 42 54.9	517.3	72.93	16 7.7	59 5.5	I. S.
17	5 55.26	2.438	5 33 47.72	156.51	25 21 10.2	270.4	73.53	15 55.2	58 19.9	I. S.
18	6 53.60	2.412	6 36 14.16	154.95	26 18 11.6	+ 15.5	73.14	15 42.9	57 34.7	I. N.
19	7 50.48	2.318	7 37 12.97	149.33	+ 25 35 53.6	- 222.4	71.71	15 31.4	56 52.5	I. N.
20	8 44.51	2.180	8 35 20.45	140.99	23 25 4.9	424.7	69.54	15 21.1	56 14.6	I. N.
21	9 34.98	2.027	9 29 53.74	131.80	20 1 59.4	583.2	67.09	15 12.0	55 41.4	I. N.
22	10 21.91	1.887	10 20 53.53	123.42	15 44 26.9	697.4	64.78	15 4.3	55 13.0	I. N.
23	11 5.82	1.777	11 8 51.57	116.77	10 49 20.9	771.8	62.91	14 57.8	54 49.0	I. N.
24	11 47.50	1.703	11 54 36.02	112.32	+ 5 31 40.4	- 811.1	61.64	14 52.5	54 29.6	I. N.
25	12 27.87	1.668	12 39 1.59	110.21	+ 0 4 31.3	819.7	61.04	14 48.4	54 14.7	II. N. S.
26	13 7.86	1.671	13 23 4.18	110.40	- 5 20 22.0	800.1	61.12	14 45.7	54 4.8	II. S.
27	13 48.38	1.711	14 7 38.44	112.82	10 31 57.3	753.3	61.86	14 44.6	54 0.6	II. S.
28	14 30.28	1.786	14 53 36.05	117.31	15 19 16.9	678.5	63.18	14 45.2	54 2.9	II. S.
29	15 14.33	1.889	15 41 42.73	123.50	- 19 30 46.9	- 573.8	64.95	14 47.9	54 12.9	II. S.
30	16 1.09	2.010	16 32 32.64	130.77	22 53 59.6	436.7	66.97	14 53.0	54 31.6	II. S.
31	16 50.80	2.131	17 26 19.72	138.07	25 15 38.2	266.0	68.94	15 0.7	54 59.7	II. S.
Apr. 1	17 43.20	2.230	18 22 48.81	144.04	26 22 41.5	- 64.6	70.50	15 11.0	55 37.5	II. N.
2	18 37.51	2.287	19 21 12.80	147.47	- 26 4 23.6	+ 158.6	71.37	15 23.8	56 24.6	II. N.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.										
Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
Apr.	2 18 37.51	2.287	19 21 12.80	147.47	-26 4 23.6	+158.6	71.37	15 23.8	56 24.6	II. N.
	3 19 32.59	2.295	20 20 23.23	147.91	24 14 45.5	389.2	71.45	15 38.7	57 19.2	II. N.
	4 20 27.32	2.262	21 19 12.95	145.93	20 54 33.3	608.4	70.90	15 54.9	58 18.4	II. N.
	5 21 21.02	2.212	22 16 59.84	142.94	16 11 53.2	798.6	70.09	16 11.0	59 17.6	II. N.
	6 22 13.57	2.171	23 13 38.34	140.48	10 21 38.4	943.9	69.40	16 25.5	60 10.9	II. N.
	7 23 5.47	2.160	0 9 37.20	139.80	-3 44 33.8	+1030.7	69.17	16 36.7	60 52.1	
	8 23 57.57	2.190	1 5 48.71	141.60	+3 13 38.8	1048.0	69.62	16 43.2	61 15.7	
	10 0 50.91	2.262	2 3 14.35	145.93	10 3 33.4	988.4	70.73	16 43.9	61 18.4	
	11 1 46.37	2.363	3 2 47.51	152.00	16 13 56.8	850.9	72.29	16 38.9	61 0.2	I. S.
	12 2 44.34	2.465	4 4 51.82	158.15	21 14 54.5	643.5	73.86	16 29.1	60 24.1	I. S.
	13 3 44.36	2.527	5 8 59.52	161.87	+24 42 9.2	+386.6	74.82	16 15.8	59 35.4	I. S.
	14 4 45.01	2.513	6 13 44.91	161.04	26 21 41.2	+110.8	74.69	16 0.8	58 40.2	I. N.
	15 5 44.30	2.415	7 17 8.66	155.17	26 12 45.5	-150.6	73.28	15 45.5	57 44.3	I. N.
	16 6 40.48	2.259	8 17 24.88	145.78	24 26 34.6	372.6	70.95	15 31.2	56 51.7	I. N.
	17 7 32.60	2.084	9 13 37.17	135.25	21 21 22.1	545.1	68.22	15 18.5	56 5.1	I. N.
	18 8 20.63	1.923	10 5 43.40	125.55	+17 16 54.2	-669.7	65.59	15 7.8	55 26.0	I. N.
	19 9 5.16	1.795	10 54 19.25	117.84	12 31 8.6	752.8	63.42	14 59.3	54 54.6	I. N.
	20 9 47.10	1.707	11 40 18.94	112.58	7 19 15.8	801.2	61.89	14 52.8	54 30.6	I. N.
	21 10 27.44	1.662	12 24 42.73	109.83	+1 54 3.8	820.0	61.05	14 48.1	54 13.6	I. N.
	22 11 7.18	1.657	13 8 30.51	109.55	-3 33 7.7	811.4	60.92	14 45.2	54 3.0	I. N.
	23 11 47.28	1.690	13 52 39.51	111.57	-8 51 31.3	-775.9	61.48	14 43.9	53 58.1	I. N.
	24 12 28.61	1.759	14 38 2.71	115.68	13 50 4.1	712.0	62.65	14 44.1	53 58.8	II. N. S.
	25 13 11.94	1.856	15 25 26.26	121.53	18 16 56.3	617.1	64.29	14 45.8	54 5.1	II. S.
	26 13 57.84	1.971	16 15 24.30	128.42	21 59 18.4	489.2	66.21	14 49.2	54 17.4	II. S.
	27 14 46.54	2.086	17 8 11.00	135.37	24 43 43.0	327.4	68.11	14 54.3	54 36.3	II. S.
May	28 15 37.81	2.181	18 3 32.11	141.07	-26 17 14.0	-135.6	69.65	15 1.4	55 2.4	II. N. S.
	29 16 30.90	2.235	19 0 42.66	144.34	26 29 23.7	+77.4	70.55	15 10.6	55 36.1	II. N.
	30 17 24.71	2.241	19 58 36.51	144.68	25 14 21.7	297.9	70.68	15 21.9	56 17.5	II. N.
	1 18 18.14	2.207	20 56 7.81	142.63	22 32 15.8	510.2	70.17	15 35.1	57 6.0	II. N.
	2 19 10.49	2.155	21 52 33.68	139.49	18 29 12.8	700.5	69.35	15 49.8	57 59.8	II. N.
	3 20 1.62	2.110	22 47 46.42	136.77	-13 16 18.6	+857.5	68.61	16 5.0	58 55.7	II. N.
	4 20 51.98	2.093	23 42 12.78	135.81	7 8 51.8	971.5	68.30	16 19.6	59 49.3	II. N.
	5 21 42.44	2.120	0 36 45.59	137.41	-0 26 16.5	1031.4	68.66	16 32.0	60 34.8	II. N.
	6 22 34.14	2.196	1 32 32.42	141.98	+6 27 28.1	1025.2	69.78	16 40.6	61 6.4	II. N.
	7 23 28.21	2.316	2 30 41.89	149.17	13 3 37.8	942.0	71.57	16 44.2	61 19.4	
	9 0 25.47	2.457	3 32 3.60	157.67	+18 50 1.7	+776.5	73.66	16 41.9	61 11.2	
	10 1 25.96	2.576	4 36 39.86	164.86	23 14 51.7	537.0	75.43	16 34.0	60 42.3	I. S.
	11 2 28.54	2.622	5 43 21.28	167.59	25 53 19.6	+250.6	76.13	16 21.7	59 57.1	I. S.
	12 3 30.95	2.561	6 49 52.91	163.94	26 34 43.2	-41.0	75.33	16 6.6	59 1.5	I. N.
	13 4 30.73	2.408	7 53 45.77	154.73	25 25 11.6	298.5	73.16	15 50.3	58 1.9	I. N.
	14 5 26.18	2.210	8 53 18.76	142.83	+22 43 27.1	-500.2	70.22	15 34.5	57 3.9	I. N.
	15 6 16.85	2.016	9 48 3.54	131.13	18 52 46.0	644.0	67.20	15 20.2	56 11.4	I. N.
	16 7 3.20	1.854	10 38 28.95	121.42	14 14 48.8	738.4	64.57	15 8.1	55 27.0	I. N.
	17 7 46.22	1.739	11 25 33.65	114.46	9 7 14.0	793.8	62.60	14 58.6	54 51.9	I. N.
	18 8 27.04	1.671	12 10 26.01	110.38	+3 43 49.9	-818.5	61.39	14 51.6	54 26.2	I. N.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
May 18	8 27.04	1.671	12 10 26.01	110.38	+ 3 43 49.9	- 818.5	61.39	14 51.6	54 26.2	I. N.
19	9 6.79	1.649	12 54 14.26	109.09	- 1 44 8.1	817.1	60.95	14 47.0	54 9.5	I. N.
20	9 46.55	1.671	13 38 2.96	110.39	7 6 32.4	790.7	61.26	14 44.7	54 1.2	I. N.
21	10 27.31	1.732	14 22 51.62	114.05	12 13 9.0	737.7	62.24	14 44.5	54 0.3	I. N.
22	11 9.94	1.826	15 9 32.86	119.69	16 52 42.9	654.8	63.78	14 46.0	54 5.8	I. N.
23	11 55.12	1.942	15 58 47.55	126.70	- 20 52 30.3	- 538.2	65.66	14 49.0	54 17.0	I. II. N. S.
24	12 43.19	2.064	16 50 56.70	134.02	23 58 32.8	385.9	67.61	14 53.4	54 33.2	II. S.
25	13 34.02	2.167	17 45 51.37	140.22	25 56 50.5	- 200.4	69.26	14 59.2	54 54.1	II. S.
26	14 26.87	2.228	18 42 47.33	143.92	26 35 38.3	+ 9.5	70.26	15 6.2	55 19.8	II. N. S.
27	15 20.54	2.235	19 40 32.97	144.34	25 48 6.1	228.4	70.43	15 14.5	55 50.4	II. N.
28	16 13.76	2.194	20 37 51.76	141.84	- 23 34 1.3	+ 439.2	69.87	15 24.2	56 25.9	II. N.
29	17 5.63	2.127	21 33 48.93	137.82	19 59 38.8	627.9	68.88	15 35.1	57 6.0	II. N.
30	17 55.86	2.061	22 28 7.30	133.88	15 16 0.0	784.5	67.88	15 47.0	57 49.8	II. N.
31	18 44.79	2.022	23 21 7.58	131.50	9 37 4.0	903.4	67.25	15 59.5	58 35.6	II. N.
June 1	19 33.25	2.025	0 13 40.00	131.68	- 3 19 0.7	979.0	67.27	16 11.8	59 20.7	II. N.
2	20 22.40	2.080	1 6 53.69	135.00	+ 3 19 22.6	+ 1003.5	68.09	16 22.8	60 1.0	II. N.
3	21 13.53	2.189	2 2 6.19	141.56	9 55 36.7	966.2	69.72	16 31.2	60 32.0	II. N.
4	22 7.83	2.341	3 0 29.74	150.71	16 2 32.8	855.4	71.98	16 35.9	60 49.1	II. N.
5	23 6.02	2.506	4 2 47.06	160.62	21 9 14.3	664.9	74.36	16 35.8	60 48.8	
7	0 7.78	2.629	5 8 39.53	168.01	24 45 1.9	404.2	76.12	16 30.7	60 30.0	
8	1 11.40	2.653	6 16 24.00	169.48	+ 26 27 28.3	+ 105.2	76.49	16 21.0	59 54.2	I. S.
9	2 14.15	2.557	7 23 15.53	163.67	26 10 23.3	- 185.4	75.15	16 7.8	59 5.8	I. N.
10	3 13.42	2.372	8 26 37.85	152.58	24 5 38.8	428.2	72.52	15 52.7	58 10.5	I. N.
11	4 7.79	2.159	9 25 5.74	139.74	20 36 35.0	606.2	69.34	15 37.3	57 13.8	I. N.
12	4 57.19	1.964	10 18 34.27	128.00	16 8 50.7	723.1	66.32	15 22.8	56 20.7	I. N.
13	5 42.40	1.812	11 7 50.98	118.90	+ 11 4 33.6	- 791.2	63.87	15 10.2	55 34.6	I. N.
14	6 24.59	1.712	11 54 5.83	112.88	5 40 47.1	822.4	62.19	15 0.1	54 57.4	I. N.
15	7 4.99	1.663	12 38 33.35	109.92	+ 0 10 24.8	825.2	61.33	14 52.7	54 30.3	I. N.
16	7 44.81	1.662	13 22 25.46	109.88	- 5 16 11.4	803.9	61.28	14 48.2	54 13.6	I. N.
17	8 25.15	1.706	14 6 49.22	112.52	10 29 29.1	758.5	61.97	14 46.3	54 6.9	I. N.
18	9 7.03	1.790	14 52 45.54	117.54	- 15 19 23.3	- 686.2	63.31	14 46.9	54 9.3	I. N.
19	9 51.31	1.904	15 41 5.84	124.41	19 34 16.6	582.5	65.12	14 49.7	54 19.5	I. N.
20	10 38.54	2.033	16 32 24.37	132.19	23 0 38.3	443.1	67.15	14 54.3	54 36.2	I. N.
21	11 28.84	2.154	17 26 47.09	139.49	25 23 48.0	266.9	69.01	15 0.2	54 58.1	I. N. S.
22	12 21.66	2.239	18 23 41.35	144.54	26 30 1.8	- 60.2	70.29	15 7.2	55 23.8	II. S.
23	13 15.83	2.265	19 21 57.01	146.12	- 26 9 45.4	+ 162.6	70.72	15 15.0	55 52.1	II. N. S.
24	14 9.89	2.231	20 20 6.07	144.10	24 20 27.9	381.6	70.26	15 23.2	56 22.3	II. N. S.
25	15 2.60	2.157	21 16 53.73	139.61	21 7 31.7	578.2	69.18	15 31.8	56 53.8	II. N.
26	15 53.33	2.072	22 11 42.72	134.51	16 42 33.1	740.2	67.92	15 40.6	57 26.2	II. N.
27	16 42.19	2.005	23 4 38.91	130.47	11 20 42.0	861.9	66.90	15 49.5	57 59.0	II. N.
28	17 29.86	1.975	23 56 23.32	128.69	- 5 18 42.7	+ 940.7	66.46	15 58.4	58 31.6	II. N.
29	18 17.40	1.996	0 48 0.08	129.92	+ 1 5 46.6	973.8	66.80	16 6.9	59 2.6	II. N.
30	19 6.09	2.071	1 40 45.86	134.45	7 33 32.5	955.9	67.98	16 14.4	59 30.1	II. N.
July 1	19 57.23	2.199	2 35 59.50	142.16	13 42 34.9	878.6	69.92	16 20.2	59 51.4	II. N.
2	20 51.92	2.362	3 34 46.39	151.96	+ 19 7 18.1	+ 733.0	72.32	16 23.5	60 3.5	II. N.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi- diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
July 2	20 51.92	2.362	3 34 46.39	151.96	+ 19 7 18.1	+ 733.0	72.32	16 23.5	60 3.5	II. N.
3	21 50.59	2.522	4 37 32.48	161.58	23 19 31.5	516.8	74.61	16 23.5	60 3.6	II. N.
4	22 52.48	2.621	5 43 32.89	167.54	25 53 2.0	+ 243.6	75.98	16 19.8	59 50.2	II. S.
5	23 55.51	2.611	6 50 41.39	166.93	26 31 24.9	- 51.6	75.82	16 12.5	59 23.3	
7	0 56.88	2.487	7 56 10.36	159.49	25 14 50.3	324.1	74.06	16 2.1	58 45.0	
8	1 54.34	2.295	8 57 44.00	147.91	+ 22 19 36.1	- 541.2	71.24	15 49.5	57 58.8	I. N.
9	2 46.93	2.090	9 54 24.32	135.58	18 10 43.3	692.4	68.15	15 36.0	57 9.4	I. N.
10	3 34.87	1.912	10 46 25.37	124.94	13 13 37.5	784.2	65.40	15 22.9	56 21.1	I. N.
11	4 19.10	1.782	11 34 43.05	117.07	7 49 34.7	829.2	63.30	15 11.0	55 37.5	I. N.
12	5 08.1	1.703	12 20 29.13	112.30	+ 2 14 50.7	839.3	62.00	15 1.2	55 1.5	I. N.
13	5 41.23	1.674	13 4 57.51	110.56	- 3 18 15.1	- 822.0	61.53	14 54.0	54 35.0	I. N.
14	6 21.54	1.693	13 49 19.12	111.69	8 39 37.6	780.9	61.85	14 49.6	54 19.0	I. N.
15	7 2.83	1.755	14 34 40.08	115.46	13 39 47.1	715.7	62.89	14 48.2	54 13.7	I. N.
16	7 46.10	1.856	15 21 59.60	121.50	18 8 25.8	622.5	64.52	14 49.6	54 18.9	I. N.
17	8 32.11	1.982	16 12 4.61	129.10	21 53 30.6	496.9	66.51	14 53.6	54 33.6	I. N.
18	9 21.29	2.115	17 5 19.73	137.09	- 24 41 7.6	- 335.0	68.53	14 59.7	54 56.2	I. N. S.
19	10 13.45	2.226	18 1 34.49	143.77	26 16 42.2	- 137.6	70.17	15 7.6	55 25.1	I. S.
20	11 7.72	2.287	18 59 56.23	147.43	26 27 50.8	+ 84.8	71.05	15 16.6	55 58.0	I. S.
21	12 2.68	2.283	19 58 59.51	147.20	25 7 56.7	314.0	70.98	15 26.0	56 32.5	I. II. S.
22	12 56.84	2.223	20 57 14.63	143.63	22 18 46.0	527.4	70.09	15 35.3	57 6.6	II. N. S.
23	13 49.17	2.135	21 53 39.62	138.34	- 18 10 18.6	+ 707.9	68.78	15 43.9	57 38.4	II. N.
24	14 39.38	2.051	22 47 56.84	133.27	12 58 20.5	844.1	67.51	15 51.6	58 6.6	II. N.
25	15 27.86	1.995	23 40 30.20	129.89	7 1 28.3	932.0	66.68	15 58.2	58 30.7	II. N.
26	16 15.50	1.983	0 32 12.93	129.16	- 0 39 15.5	970.8	66.55	16 3.6	58 50.5	II. N.
27	17 3.46	2.023	1 24 14.93	131.53	+ 5 48 21.4	958.7	67.22	16 7.7	59 5.7	II. N.
28	17 53.00	2.114	2 17 52.05	137.05	+ 12 0 33.6	+ 892.9	68.67	16 10.6	59 16.3	II. N.
29	18 45.28	2.248	3 14 13.91	145.09	17 34 52.6	768.4	70.72	16 12.1	59 21.8	II. N.
30	19 41.04	2.398	4 14 5.33	154.15	22 7 4.1	582.4	72.93	16 12.0	59 21.3	II. N.
31	20 40.18	2.521	5 17 20.28	161.55	25 13 6.9	339.8	74.68	16 9.9	59 13.6	II. N.
Aug. 1	21 41.43	2.566	6 22 41.74	164.25	26 34 12.7	+ 62.5	75.26	16 5.6	58 58.0	II. S.
2	22 42.52	2.507	7 27 53.63	160.69	+ 26 3 8.3	- 214.6	74.36	15 59.2	58 34.3	II. S.
3	23 41.07	2.362	8 30 33.19	151.93	23 47 32.1	455.0	72.19	15 50.7	58 3.2	
5	0 35.56	2.177	9 29 7.98	140.81	20 6 50.4	638.0	69.39	15 40.6	57 26.4	
6	1 25.60	1.998	10 23 15.30	130.04	15 25 20.4	759.7	66.62	15 29.7	56 46.3	I. N.
7	2 11.71	1.852	11 13 25.93	121.27	10 6 16.0	827.6	64.31	15 18.8	56 6.1	I. N.
8	2 54.86	1.751	12 0 38.29	115.24	+ 4 28 57.9	- 852.6	62.70	15 8.6	55 28.9	I. N.
9	3 36.17	1.699	12 46 0.44	112.10	- 1 11 22.2	844.2	61.88	15 0.0	54 57.2	I. N.
10	4 16.79	1.694	13 30 40.87	111.74	6 42 43.1	808.4	61.84	14 53.5	54 33.4	I. N.
11	4 57.81	1.732	14 15 45.24	114.05	11 54 48.9	748.0	62.53	14 49.6	54 19.2	I. N.
12	5 40.24	1.810	15 2 14.40	118.74	16 37 44.3	662.2	63.87	14 48.7	54 15.7	I. N.
13	6 24.95	1.920	15 51 0.82	125.38	- 20 40 43.2	- 547.6	65.68	14 50.7	54 23.0	I. N.
14	7 12.55	2.048	16 42 41.46	133.08	23 51 26.8	400.3	67.70	14 55.6	54 41.0	I. N.
15	8 3.22	2.172	17 37 26.76	140.51	25 56 17.5	218.3	69.56	15 3.2	55 8.8	I. N. S.
16	8 56.52	2.262	18 34 49.81	145.95	26 41 57.8	- 5.7	70.89	15 12.9	55 44.5	I. S.
17	9 51.36	2.297	19 33 45.60	148.07	- 25 58 32.1	+ 224.4	71.35	15 24.1	56 25.6	I. S.

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi- diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Aug. 17	9 51.36	2.297	19 33 45.60	148.07	- 25 58 32.1	+ 224.4	71.35	15 24.1	56 25.6	I. S.
18	10 46.31	2.273	20 32 48.47	146.61	23 42 45.7	452.3	70.92	15 35.9	57 9.1	I. S.
19	11 40.12	2.206	21 30 42.33	142.60	19 59 51.4	656.7	69.88	15 47.4	57 51.4	I. S.
20	12 32.10	2.126	22 26 46.35	137.78	15 2 48.7	820.8	68.65	15 57.7	58 29.0	II. N. S.
21	13 22.29	2.061	23 21 2.36	133.84	9 10 2.8	934.1	67.65	16 5.9	58 59.0	II. N.
22	14 11.30	2.030	0 14 7.45	132.02	- 2 42 56.9	+ 991.9	67.22	16 11.6	59 19.8	II. N.
23	15 0.11	2.046	1 7 0.95	132.94	+ 3 55 47.8	992.1	67.53	16 14.6	59 30.8	II. N.
24	15 49.88	2.110	2 0 52.02	136.78	10 22 57.0	933.7	68.59	16 15.0	59 32.5	II. N.
25	16 41.72	2.215	2 56 47.08	143.14	16 14 54.1	816.0	70.28	16 13.3	59 26.3	II. N.
26	17 36.40	2.343	3 55 33.77	150.81	21 7 55.9	+ 639.5	72.23	16 10.0	59 13.9	II. N.
27	18 34.06	2.456	4 57 19.53	157.64	+ 24 39 32.1	+ 410.6	73.90	16 5.2	58 56.5	II. N.
28	19 33.85	2.513	6 1 12.82	161.02	26 31 44.6	+ 146.5	74.68	15 59.4	58 35.2	II. S.
29	20 33.06	2.482	7 5 26.11	159.14	26 35 44.5	- 124.9	74.17	15 52.7	58 10.7	II. S.
30	21 32.29	2.368	8 7 52.21	152.32	24 55 3.6	372.0	72.43	15 45.3	57 43.5	II. S.
31	22 27.24	2.206	9 6 54.34	142.59	21 44 22.8	572.3	69.93	15 37.2	57 13.8	II. S.
Sept. 1	23 18.14	2.038	10 1 53.41	132.44	+ 17 24 39.8	- 716.9	67.27	15 28.6	56 42.3	
3	0 5.22	1.892	10 53 2.80	123.68	12 17 58.8	808.2	64.92	15 19.8	56 9.9	
4	0 49.25	1.784	11 41 8.05	117.19	6 44 18.5	853.2	63.15	15 11.1	55 38.1	
5	1 31.20	1.719	12 27 8.71	113.32	+ 1 0 28.9	860.1	62.11	15 3.1	55 8.6	I. N.
6	2 12.13	1.698	13 12 7.64	112.05	- 4 39 34.5	835.3	61.81	14 56.2	54 43.2	I. N.
7	2 53.05	1.719	13 57 6.25	113.26	- 10 4 1.4	- 782.5	62.23	14 51.0	54 24.0	I. N.
8	3 34.93	1.777	14 43 2.16	116.77	15 2 5.5	703.3	63.28	14 47.9	54 12.8	I. N.
9	4 18.60	1.868	15 30 46.47	122.22	19 23 5.0	596.8	64.84	14 47.4	54 11.0	I. N.
10	5 4.74	1.980	16 20 58.83	128.96	22 55 38.5	460.7	66.71	14 49.8	54 19.6	I. N.
11	5 53.67	2.097	17 13 59.37	136.01	25 27 31.6	293.4	68.59	14 55.1	54 39.1	I. N.
12	6 45.25	2.196	18 9 39.08	141.99	- 26 46 21.6	- 96.3	70.11	15 3.4	55 9.4	I. S.
13	7 38.77	2.255	19 7 15.52	145.55	26 41 30.0	+ 123.3	70.97	15 14.2	55 49.4	I. S.
14	8 32.10	2.264	20 5 40.88	146.04	25 6 39.2	350.9	71.03	15 27.2	56 37.0	I. S.
15	9 27.06	2.227	21 3 43.82	143.84	22 2 3.7	568.9	70.41	15 41.4	57 29.1	I. S.
16	10 19.82	2.168	22 0 34.43	140.28	17 35 16.0	759.1	69.44	15 55.6	58 21.3	I. S.
17	11 11.14	2.112	22 55 58.80	136.91	- 12 0 22.1	+ 907.2	68.53	16 8.6	59 9.0	I. S.
18	12 1.39	2.082	23 50 18.89	135.10	- 5 36 39.0	1001.7	68.05	16 19.1	59 47.5	I. II. S.
19	12 51.39	2.092	0 44 23.29	135.72	+ 1 12 47.6	1034.7	68.23	16 26.0	60 12.7	II. N. S.
20	13 42.17	2.147	1 39 15.03	139.07	8 2 9.3	1000.6	69.14	16 28.7	60 22.6	II. N.
21	14 34.80	2.244	2 35 58.21	144.90	14 24 2.2	897.1	70.68	16 27.2	60 17.3	II. N.
22	15 30.09	2.364	3 35 20.92	152.09	+ 19 50 51.4	+ 726.0	72.56	16 22.2	59 59.0	II. N.
23	16 28.20	2.473	4 37 33.72	158.65	23 57 7.0	496.7	74.23	16 14.6	59 30.8	II. N.
24	17 28.36	2.528	5 41 49.90	161.96	26 23 1.6	+ 228.7	75.06	16 5.2	58 56.4	II. N.
25	18 28.86	2.498	6 46 26.52	160.17	26 58 49.5	- 48.5	74.63	15 55.1	58 19.2	II. S.
26	19 27.62	2.387	7 49 18.47	153.44	25 47 20.7	303.0	72.94	15 44.9	57 41.9	II. S.
27	20 23.02	2.225	8 48 47.83	143.72	+ 23 2 24.6	- 513.1	70.45	15 35.1	57 6.0	II. S.
28	21 14.35	2.054	9 44 12.70	133.43	19 3 54.8	670.5	67.72	15 25.9	56 32.1	II. S.
29	22 1.80	1.905	10 35 43.72	124.45	14 12 51.5	776.7	65.26	15 17.3	56 0.6	II. S.
30	22 46.08	1.792	11 24 4.35	117.68	8 48 28.7	838.2	63.35	15 9.4	55 31.8	II. S.
Oct. 1	23 28.15	1.721	12 10 12.43	113.43	+ 3 7 22.5	- 861.3	62.14	15 2.3	55 5.8	

## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.		Diff. for 1 Hour of Long.	Right Ascension of Center.			Diff. for 1 Hour of Long.	Geocentric Declination of Center.			Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi-diameter.	Equatorial Horizontal Parallax.	Bright Limbs.	
	h	m	m	h	m	s	s	°	'	"	"	s	'	"	'	"
Oct. 1	23	28.15	1.721	12	10	12.43	113.43	+	3	7	22.5	861.3	62.14	15 2.3	55 5.8	
3	0	9.04	1.693	12	55	9.21	111.72	-	2	36	10.6	851.1	61.66	14 56.1	54 43.0	
4	0	49.74	1.705	13	39	54.11	112.42		8	9	33.4	810.8	61.88	14 51.0	54 24.2	
5	1	31.15	1.752	14	25	22.31	115.29		13	21	3.6	741.9	62.74	14 47.2	54 10.4	I. N.
6	2	14.09	1.831	15	12	22.39	119.99		17	59	14.0	644.2	64.11	14 45.2	54 3.0	I. N.
7	2	59.19	1.930	16	1	32.28	125.99	-	21	52	27.1	516.9	65.82	14 45.3	54 3.3	I. N.
8	3	46.80	2.036	16	53	12.87	132.38		24	48	47.7	359.8	67.60	14 47.8	54 12.5	I. N.
9	4	36.84	2.130	17	47	20.42	138.02		26	36	39.0	175.1	69.14	14 53.0	54 31.6	I. N.
10	5	28.79	2.192	18	43	22.56	141.75		27	5	59.1	31.3	70.14	15 1.1	55 1.1	I. S.
11	6	21.72	2.211	19	40	23.69	142.89		26	10	9.7	248.7	70.43	15 12.0	55 41.0	I. S.
12	7	14.60	2.190	20	37	21.56	141.59	-	23	47	28.5	463.2	70.07	15 25.3	56 30.1	I. S.
13	8	6.64	2.145	21	33	28.74	138.89		20	1	47.6	661.3	69.32	15 40.6	57 26.1	I. S.
14	8	57.53	2.099	22	28	27.49	136.13		15	2	14.8	830.6	68.54	15 56.7	58 25.3	I. S.
15	9	47.55	2.074	23	22	33.36	134.66		9	2	42.7	959.4	68.10	16 12.4	59 22.7	I. S.
16	10	37.41	2.088	0	16	29.79	135.48	-	2	21	37.6	1036.3	68.26	16 25.9	60 12.3	I. S.
17	11	28.15	2.148	1	11	18.69	139.11	+	4	37	50.2	1049.3	69.17	16 35.7	60 48.3	I. S.
18	12	20.90	2.255	2	8	8.79	145.50		11	27	51.0	987.6	70.82	16 40.6	61 6.2	II. N. S.
19	13	16.64	2.394	3	7	58.98	153.86		17	37	0.0	844.7	72.93	16 39.9	61 3.9	II. N.
20	14	15.77	2.530	4	11	13.29	162.07		22	33	12.4	624.6	74.99	16 34.1	60 42.6	II. N.
21	15	17.65	2.613	5	17	12.76	167.08		25	48	59.5	347.3	76.27	16 24.2	60 6.0	II. N.
22	16	20.43	2.600	6	24	6.24	166.29	+	27	8	12.0	48.8	76.14	16 11.5	59 19.5	II. N. S.
23	17	21.62	2.484	7	29	24.23	159.32		26	30	36.6	230.2	74.50	15 57.6	58 28.7	II. S.
24	18	19.14	2.303	8	31	1.94	148.43		24	10	30.9	460.5	71.81	15 43.8	57 38.1	II. S.
25	19	12.05	2.108	9	28	1.93	136.65		20	30	2.9	631.9	68.78	15 31.0	56 50.9	II. S.
26	20	0.49	1.934	10	20	32.37	126.25		15	52	15.8	748.5	65.97	15 19.6	56 9.1	II. S.
27	20	45.25	1.803	11	9	21.88	118.34	+	10	37	20.9	819.1	63.74	15 9.8	55 33.3	II. S.
28	21	27.41	1.718	11	55	35.17	113.25	+	5	1	53.1	852.5	62.25	15 1.7	55 3.6	II. S.
29	22	8.10	1.680	12	40	19.74	110.92	-	0	40	22.5	853.9	61.52	14 55.2	54 39.7	II. S.
30	22	48.38	1.684	13	24	39.66	111.17		6	17	20.5	826.2	61.55	14 50.2	54 21.2	II. S.
31	23	29.22	1.726	14	9	33.41	113.69		11	37	32.2	769.9	62.24	14 46.6	54 7.8	
Nov. 2	0	11.47	1.800	14	55	51.97	118.14	-	16	29	21.1	684.1	63.49	14 44.3	53 59.4	
3	0	55.79	1.896	15	44	15.11	123.96		20	40	40.3	567.2	65.12	14 43.5	53 56.5	I. N.
4	1	42.56	2.001	16	35	5.24	130.21		23	58	58.7	419.2	66.86	14 44.3	53 59.7	I. N.
5	2	31.73	2.093	17	28	19.90	135.79		26	12	8.8	242.3	68.40	14 47.1	54 9.8	I. N.
6	3	22.77	2.154	18	23	27.45	139.45		27	9	53.6	43.6	69.43	14 52.0	54 27.8	I. N.
7	4	14.76	2.171	19	19	31.98	140.48	-	26	45	35.0	165.8	69.76	14 59.3	54 54.5	I. S.
8	5	6.64	2.146	20	15	29.78	138.99		24	57	30.7	373.2	69.42	15 9.1	55 30.4	I. S.
9	5	57.57	2.096	21	10	30.68	135.95		21	49	2.2	566.2	68.66	15 21.3	56 15.3	I. S.
10	6	47.21	2.042	22	4	13.83	132.74		17	27	41.9	736.1	67.81	15 35.7	57 8.2	I. S.
11	7	35.77	2.009	22	56	51.72	130.71		12	4	9.4	876.0	67.23	15 51.6	58 6.6	I. S.
12	8	23.93	2.012	23	49	6.02	130.91	-	5	51	52.6	978.3	67.23	16 8.0	59 6.6	I. S.
13	9	12.75	2.065	0	41	59.85	134.10	+	0	52	10.4	1032.8	68.00	16 23.3	60 2.9	I. S.
14	10	3.50	2.173	1	36	49.34	140.58		7	46	9.0	1025.3	69.63	16 35.9	60 49.2	I. S.
15	10	57.45	2.330	2	34	51.71	150.03		14	22	9.9	940.6	71.98	16 44.1	61 19.2	I. S.
16	11	55.54	2.512	3	37	3.58	160.99	+	20	6	43.8	767.3	74.66	16 46.6	61 28.3	I. II. N. S.



## AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semi- diameter.	Equatorial Horizontal Parallax.	Bright Limbs.
	h m	m	h m s	s	° ' "	"	s	' "	' "	
Nov. 16	11 55.54	2.512	3 37 3.58	160.99	+ 20 6 43.8	+ 767.3	74.66	16 46.6	61 28.3	I. II. N. S.
17	12 57.80	2.666	4 43 25.98	170.25	24 24 37.1	509.7	76.90	16 42.9	61 14.9	II. N.
18	14 2.75	2.726	5 52 30.29	173.84	26 47 9.7	+ 197.7	77.79	16 33.7	60 41.2	II. N.
19	15 7.56	2.653	7 1 25.99	169.46	27 2 13.5	- 118.4	76.83	16 20.4	59 52.3	II. N. S.
20	16 9.21	2.471	8 7 11.54	158.54	25 18 25.1	390.4	74.28	16 4.8	58 54.8	II. S.
21	17 5.83	2.245	9 7 54.47	144.94	+ 21 59 14.4	- 593.6	70.94	15 48.5	57 55.3	II. S.
22	17 57.08	2.031	10 3 14.52	132.08	17 32 31.7	729.4	67.63	15 33.1	56 58.7	II. S.
23	18 43.70	1.862	10 53 55.78	121.87	12 23 1.5	810.0	64.88	15 19.4	56 8.2	II. S.
24	19 26.88	1.746	11 41 10.45	114.89	6 50 3.9	848.7	62.90	15 7.8	55 25.8	II. S.
25	20 7.92	1.683	12 26 16.37	111.12	+ 1 8 19.3	855.2	61.77	14 58.6	54 52.1	II. S.
26	20 48.06	1.669	13 10 27.51	110.29	- 4 30 26.6	- 834.3	61.47	14 51.8	54 27.0	II. S.
27	21 28.40	1.699	13 54 51.00	112.10	9 55 41.4	787.5	61.91	14 47.1	54 9.9	II. S.
28	22 9.92	1.767	14 40 25.91	116.16	14 56 47.4	713.2	62.99	14 44.4	53 59.9	II. S.
29	22 53.43	1.863	15 28 0.18	121.92	19 22 12.6	608.7	64.54	14 43.4	53 56.3	II. S.
30	23 39.44	1.972	16 18 4.88	128.52	22 59 21.1	471.5	66.30	14 44.0	53 58.4	
Dec. 2	0 28.04	2.075	17 10 45.56	134.68	- 25 35 13.7	- 302.7	67.94	14 46.0	54 5.8	
3	1 18.78	2.147	18 5 35.02	139.04	26 58 8.7	- 108.3	69.11	14 49.5	54 18.5	I. N.
4	2 10.70	2.171	19 1 35.15	140.47	27 0 0.5	+ 100.1	69.54	14 54.5	54 36.9	I. N.
5	3 2.58	2.145	19 57 32.75	138.89	25 38 17.1	307.0	69.20	15 1.1	55 1.3	I. S.
6	3 53.35	2.082	20 52 24.14	135.17	22 56 24.1	499.0	68.31	15 9.5	55 32.1	I. S.
7	4 42.46	2.010	21 45 35.51	130.81	- 19 2 32.6	+ 665.8	67.23	15 19.8	56 9.8	I. S.
8	5 29.96	1.952	22 37 9.88	127.30	14 7 41.8	803.2	66.33	15 31.9	56 54.1	I. S.
9	6 16.44	1.928	23 27 42.61	125.85	8 24 19.1	907.9	65.94	15 45.4	57 43.8	I. S.
10	7 2.88	1.951	0 18 13.32	127.26	- 2 6 14.2	975.8	66.30	15 59.9	58 36.9	I. S.
11	7 50.56	2.032	1 9 58.17	132.09	+ 4 30 17.3	998.4	67.54	16 14.3	59 29.7	I. S.
12	8 40.88	2.172	2 4 22.52	140.53	+ 11 4 42.0	+ 962.5	69.68	16 27.2	60 17.2	I. S.
13	9 35.22	2.363	3 2 48.37	152.02	17 10 22.2	851.9	72.51	16 37.1	60 53.6	I. S.
14	10 34.45	2.571	4 6 8.12	164.51	22 14 30.4	653.9	75.51	16 42.5	61 13.4	I. N. S.
15	11 38.23	2.730	5 14 2.39	174.11	25 42 19.8	373.6	77.75	16 42.3	61 12.8	I. N. S.
16	12 44.51	2.768	6 24 26.18	176.37	27 6 59.1	+ 46.4	78.28	16 36.4	60 50.9	II. N.
17	13 49.87	2.657	7 33 55.48	169.69	+ 26 20 59.9	- 269.7	76.76	16 25.4	60 10.5	II. N. S.
18	14 51.20	2.443	8 39 21.71	156.84	23 39 23.8	525.7	73.74	16 10.9	59 17.2	II. S.
19	15 46.93	2.202	9 39 11.35	142.36	19 31 4.0	702.9	70.19	15 54.6	58 17.6	II. S.
20	16 37.15	1.990	10 33 29.41	129.60	14 26 38.4	808.6	66.92	15 38.3	57 17.7	II. S.
21	17 22.90	1.831	11 23 18.06	120.04	8 51 32.4	859.2	64.37	15 23.2	56 22.2	II. S.
22	18 5.53	1.731	12 9 59.71	114.02	+ 3 4 35.3	- 869.9	62.69	15 10.1	55 34.4	II. S.
23	18 46.43	1.686	12 54 56.94	111.31	- 2 40 28.8	850.9	61.90	14 59.7	54 56.1	II. S.
24	19 26.86	1.691	13 39 26.09	111.61	8 12 53.4	807.1	61.95	14 52.1	54 28.1	II. S.
25	20 7.96	1.740	14 24 35.37	114.58	13 22 54.0	738.7	62.73	14 47.2	54 10.2	II. S.
26	20 50.70	1.826	15 11 23.12	119.72	18 0 19.7	643.6	64.09	14 44.9	54 1.8	II. S.
27	21 35.80	1.935	16 0 33.22	126.29	- 21 53 44.8	- 518.1	65.81	14 44.9	54 1.7	II. S.
28	22 23.62	2.049	16 52 26.80	133.10	24 50 29.5	360.2	67.56	14 46.8	54 8.8	II. S.
29	23 13.96	2.141	17 46 52.20	138.66	26 37 52.7	- 172.4	68.96	14 50.4	54 21.9	
31	0 6.02	2.188	18 43 0.86	141.50	- 27 5 35.7	+ 35.9	69.68	14 55.3	54 39.8	

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	1 12.7	19 50 47.62	-23 2 47.6	7.2	2.8	0.20	Feb. 14	22 29.2	20 8 12.49	-19 13 9.6	9.8	3.7	0.26
1	1 15.1	19 57 12.07	22 41 23.9	7.3	2.8	0.21	15	22 28.7	20 11 40.24	19 13 55.9	9.6	3.7	0.26
2	1 17.4	20 3 28.16	22 18 41.4	7.5	2.9	0.21	16	22 28.4	20 15 22.33	19 13 25.9	9.5	3.6	0.25
3	1 19.6	20 9 34.56	21 54 45.2	7.7	2.9	0.21	17	22 28.4	20 19 17.53	19 11 38.9	9.3	3.5	0.25
4	1 21.6	20 15 29.77	21 29 41.5	7.8	3.0	0.21	18	22 28.6	20 23 24.71	19 8 34.4	9.2	3.5	0.25
5	1 23.3	20 21 12.09	-21 3 37.8	8.0	3.0	0.22	19	22 29.0	20 27 42.85	-19 4 11.8	9.0	3.4	0.24
6	1 24.8	20 26 39.61	20 36 43.2	8.2	3.1	0.22	20	22 29.5	20 32 11.00	18 58 30.9	8.9	3.4	0.24
7	1 26.1	20 31 50.21	20 9 8.4	8.4	3.2	0.23	21	22 30.2	20 36 48.32	18 51 31.5	8.7	3.3	0.23
8	1 27.0	20 36 41.53	19 41 5.8	8.6	3.2	0.23	22	22 31.0	20 41 34.05	18 43 13.4	8.6	3.3	0.23
9	1 27.5	20 41 10.98	19 12 50.0	8.8	3.3	0.24	23	22 31.9	20 46 27.47	18 33 36.4	8.5	3.2	0.23
10	1 27.7	20 45 15.76	-18 44 37.2	9.0	3.4	0.24	24	22 33.0	20 51 27.96	-18 22 40.4	8.4	3.2	0.22
11	1 27.3	20 48 52.88	18 16 45.8	9.3	3.5	0.25	25	22 34.2	20 56 34.94	18 10 25.4	8.3	3.1	0.22
12	1 26.5	20 51 59.19	17 49 36.2	9.5	3.6	0.25	26	22 35.4	21 1 47.89	17 56 51.5	8.2	3.1	0.22
13	1 25.1	20 54 31.49	17 23 30.4	9.8	3.7	0.26	27	22 36.8	21 7 6.36	17 41 58.8	8.1	3.1	0.21
14	1 23.1	20 56 26.61	16 58 51.4	10.1	3.8	0.27	28	22 38.2	21 12 29.92	17 25 47.3	8.0	3.0	0.21
15	1 20.4	20 57 41.57	-16 36 2.8	10.5	4.0	0.28	Mar. 1	22 39.8	21 17 58.20	-17 8 17.1	7.9	3.0	0.21
16	1 17.0	20 58 13.76	16 15 28.6	10.8	4.1	0.28	2	22 41.4	21 23 30.85	16 49 28.5	7.8	3.0	0.21
17	1 12.9	20 58 1.18	15 57 31.0	11.1	4.2	0.29	3	22 43.0	21 29 7.57	16 29 21.6	7.7	2.9	0.20
18	1 8.0	20 57 2.63	15 42 29.5	11.5	4.3	0.30	4	22 44.7	21 34 48.09	16 7 56.6	7.6	2.9	0.20
19	1 2.3	20 55 18.01	15 30 40.3	11.8	4.5	0.31	5	22 46.5	21 40 32.18	15 45 13.7	7.5	2.9	0.20
20	0 55.9	20 52 48.57	-15 22 14.7	12.1	4.6	0.32	6	22 48.4	21 46 19.65	-15 21 13.2	7.5	2.8	0.20
21	0 48.8	20 49 37.03	15 17 17.7	12.4	4.7	0.33	7	22 50.3	21 52 10.32	14 55 55.5	7.4	2.8	0.19
22	0 41.0	20 45 47.67	15 15 47.6	12.7	4.8	0.33	8	22 52.2	21 58 4.02	14 29 20.9	7.3	2.8	0.19
23	0 32.7	20 41 26.35	15 17 36.0	12.9	4.9	0.34	9	22 54.2	22 4 0.62	14 1 29.6	7.3	2.8	0.19
24	0 24.0	20 36 40.29	15 22 27.9	13.1	5.0	0.34	10	22 56.3	22 10 0.01	13 32 21.9	7.2	2.7	0.19
25	0 15.1	20 31 37.69	-15 30 2.9	13.2	5.0	0.35	11	22 58.4	22 16 2.13	-13 1 58.3	7.1	2.7	0.19
26	0 6.0	20 26 27.32	15 39 56.8	13.3	5.1	0.35	12	23 0.5	22 22 6.91	12 30 19.1	7.1	2.7	0.18
26	23 56.9	20 21 18.07	15 51 43.5	13.4	5.1	0.35	13	23 2.7	22 28 14.31	11 57 24.7	7.0	2.7	0.18
27	23 48.0	20 16 18.30	16 4 56.2	13.4	5.1	0.35	14	23 4.9	22 34 24.31	11 23 15.5	7.0	2.6	0.18
28	23 39.4	20 11 35.53	16 19 9.3	13.3	5.0	0.35	15	23 7.1	22 40 36.91	10 47 52.0	6.9	2.6	0.18
29	23 31.1	20 7 16.05	-16 33 59.4	13.2	5.0	0.35	16	23 9.4	22 46 52.14	-10 11 14.6	6.9	2.6	0.18
30	23 23.4	20 3 24.82	16 49 5.9	13.0	4.9	0.34	17	23 11.8	22 53 10.03	9 33 23.9	6.8	2.6	0.18
31	23 16.1	20 0 5.39	17 4 11.3	12.9	4.9	0.34	18	23 14.2	22 59 30.63	8 54 20.3	6.8	2.6	0.17
Feb. 1	23 9.4	19 57 20.02	17 19 0.8	12.7	4.8	0.34	19	23 16.6	23 5 54.01	8 14 4.5	6.8	2.6	0.17
2	23 3.3	19 55 9.79	17 33 22.5	12.5	4.7	0.33	20	23 19.1	23 12 20.25	7 32 37.2	6.7	2.6	0.17
3	22 57.8	19 53 34.83	-17 47 7.0	12.2	4.6	0.32	21	23 21.6	23 18 49.45	-6 49 59.2	6.7	2.5	0.17
4	22 52.9	19 52 34.50	18 0 6.5	12.0	4.6	0.32	22	23 24.2	23 25 21.72	6 6 11.2	6.7	2.5	0.17
5	22 48.5	19 52 7.62	18 12 14.7	11.8	4.5	0.31	23	23 26.9	23 31 57.18	5 21 14.3	6.6	2.5	0.17
6	22 44.7	19 52 12.62	18 23 26.6	11.5	4.4	0.31	24	23 29.6	23 38 35.94	4 35 9.7	6.6	2.5	0.17
7	22 41.3	19 52 47.68	18 33 38.1	11.3	4.3	0.30	25	23 32.3	23 45 18.15	3 47 58.8	6.6	2.5	0.17
8	22 38.4	19 53 50.85	-18 42 45.9	11.1	4.2	0.30	26	23 35.1	23 52 3.95	-2 59 43.3	6.6	2.5	0.17
9	22 36.0	19 55 20.15	18 50 47.2	10.8	4.1	0.29	27	23 38.0	23 58 53.48	2 10 24.8	6.6	2.5	0.17
10	22 33.9	19 57 13.61	18 57 39.8	10.6	4.0	0.28	28	23 41.0	0 5 46.85	1 20 5.5	6.5	2.5	0.17
11	22 32.3	19 59 29.33	19 3 21.8	10.4	3.9	0.28	29	23 44.0	0 12 44.19	-0 28 48.1	6.5	2.5	0.17
12	22 30.9	20 2 5.50	19 7 51.6	10.2	3.9	0.27	30	23 47.0	0 19 45.62	+ 0 23 24.4	6.5	2.5	0.17
13	22 29.9	20 5 0.42	-19 11 7.9	10.0	3.8	0.27	31	23 50.2	0 26 51.23	+ 1 16 28.3	6.5	2.5	0.17
14	22 29.2	20 8 12.49	-19 13 9.6	9.8	3.7	0.26	Apr. 1	23 53.4	0 34 1.07	+ 2 10 19.6	6.5	2.5	0.17

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	23 53.4	0 34 1.07	+2 10 19.6	6.5	2.5	0.17	May 18	0 38.2	4 20 17.16	+21 48 49.3	15.1	5.7	0.41
2	23 56.7	0 41 15.17	3 4 53.6	6.5	2.5	0.17	19	0 32.9	4 18 58.06	21 28 55.9	15.3	5.8	0.42
4	0 0.0	0 48 33.49	4 0 4.7	6.6	2.5	0.17	20	0 27.5	4 17 25.73	21 7 58.7	15.5	5.9	0.42
5	0 3.4	0 55 55.95	4 55 46.3	6.6	2.5	0.17	21	0 21.8	4 15 42.06	20 46 9.0	15.6	5.9	0.42
6	0 6.9	1 3 22.40	5 51 51.3	6.6	2.5	0.17	22	0 16.0	4 13 49.12	20 23 39.4	15.8	6.0	0.43
7	0 10.5	1 10 52.60	+6 48 11.6	6.6	2.5	0.17	23	0 10.1	4 11 49.08	+20 0 43.7	15.9	6.0	0.43
8	0 14.1	1 18 26.22	7 44 37.9	6.7	2.5	0.17	24	0 4.1	4 9 44.20	19 37 36.4	16.0	6.1	0.43
9	0 17.8	1 26 2.80	8 41 0.0	6.7	2.5	0.17	24	23 58.0	4 7 36.81	19 14 32.6	16.0	6.1	0.43
10	0 21.5	1 33 41.79	9 37 6.9	6.8	2.6	0.17	25	23 52.0	4 5 29.22	18 51 47.8	16.0	6.1	0.43
11	0 25.2	1 41 22.53	10 32 46.7	6.8	2.6	0.18	26	23 45.9	4 3 23.70	18 29 37.4	16.0	6.1	0.43
12	0 28.9	1 49 4.23	+11 27 47.1	6.9	2.6	0.18	27	23 40.0	4 1 22.45	+18 8 16.4	15.9	6.0	0.42
13	0 32.7	1 56 45.98	12 21 55.1	7.0	2.6	0.18	28	23 34.2	3 59 27.53	17 47 59.1	15.8	6.0	0.42
14	0 36.4	2 4 26.76	13 14 57.4	7.1	2.7	0.18	29	23 28.5	3 57 40.86	17 28 58.8	15.7	6.0	0.42
15	0 40.1	2 12 5.47	14 6 40.8	7.2	2.7	0.19	30	23 22.9	3 56 4.16	17 11 27.3	15.6	5.9	0.41
16	0 43.7	2 19 40.93	14 56 52.8	7.3	2.8	0.19	31	23 17.6	3 54 38.98	16 55 35.1	15.4	5.9	0.41
17	0 47.3	2 27 11.91	+15 45 21.6	7.4	2.8	0.19	June 1	23 12.4	3 53 26.66	+16 41 31.1	15.2	5.8	0.40
18	0 50.8	2 34 37.16	16 31 56.2	7.5	2.8	0.20	2	23 7.5	3 52 28.33	16 29 22.2	15.0	5.7	0.40
19	0 54.1	2 41 55.42	17 16 26.8	7.6	2.9	0.20	3	23 2.9	3 51 44.91	16 19 13.7	14.8	5.6	0.39
20	0 57.3	2 49 5.47	17 58 45.0	7.8	3.0	0.21	4	22 58.5	3 51 17.16	16 11 9.2	14.6	5.5	0.38
21	1 0.4	2 56 6.10	18 38 43.8	7.9	3.0	0.21	5	22 54.4	3 51 5.68	16 5 10.7	14.3	5.4	0.38
22	1 3.3	3 2 56.17	+19 16 17.7	8.1	3.1	0.22	6	22 50.5	3 51 10.90	+16 1 18.9	14.0	5.3	0.37
23	1 6.0	3 9 34.59	19 51 22.7	8.3	3.2	0.22	7	22 47.0	3 51 33.11	15 59 33.0	13.8	5.2	0.36
24	1 8.4	3 16 0.34	20 23 56.0	8.5	3.2	0.23	8	22 43.7	3 52 12.51	15 59 51.1	13.5	5.1	0.35
25	1 10.7	3 22 12.50	20 53 56.1	8.7	3.3	0.24	9	22 40.7	3 53 9.21	16 2 10.5	13.2	5.0	0.35
26	1 12.7	3 28 10.19	21 21 22.6	8.9	3.4	0.24	10	22 38.0	3 54 23.23	16 6 27.3	12.9	4.9	0.34
27	1 14.5	3 33 52.58	+21 46 15.9	9.1	3.5	0.25	11	22 35.6	3 55 54.55	+16 12 37.0	12.6	4.8	0.33
28	1 16.0	3 39 18.93	22 8 37.0	9.4	3.6	0.26	12	22 33.4	3 57 43.12	16 20 34.6	12.4	4.7	0.33
29	1 17.2	3 44 28.54	22 28 27.8	9.6	3.7	0.26	13	22 31.6	3 59 48.85	16 30 14.6	12.1	4.6	0.32
30	1 18.1	3 49 20.74	22 45 50.5	9.9	3.8	0.27	14	22 30.0	4 2 11.63	16 41 31.2	11.8	4.5	0.31
May 1	1 18.7	3 53 54.91	23 0 47.4	10.1	3.9	0.28	15	22 28.8	4 4 51.34	16 54 17.9	11.5	4.4	0.30
2	1 19.0	3 58 10.50	+23 13 21.1	10.4	4.0	0.29	16	22 27.8	4 7 47.88	+17 8 28.1	11.2	4.3	0.30
3	1 19.0	4 2 6.98	23 23 34.3	10.7	4.1	0.29	17	22 27.1	4 11 1.15	17 23 55.0	11.0	4.2	0.29
4	1 18.7	4 5 43.86	23 31 29.8	11.0	4.2	0.30	18	22 26.6	4 14 31.07	17 40 31.6	10.7	4.1	0.29
5	1 18.0	4 9 0.69	23 37 10.4	11.3	4.3	0.31	19	22 26.4	4 18 17.58	17 58 10.5	10.5	4.0	0.28
6	1 17.0	4 11 57.08	23 40 38.8	11.6	4.4	0.32	20	22 26.5	4 22 20.64	18 16 44.2	10.3	3.9	0.27
7	1 15.7	4 14 32.70	+23 41 57.7	11.9	4.5	0.33	21	22 26.9	4 26 40.23	+18 36 5.0	10.0	3.8	0.27
8	1 14.0	4 16 47.28	23 41 9.7	12.2	4.6	0.34	22	22 27.6	4 31 16.35	18 56 4.9	9.8	3.7	0.26
9	1 12.0	4 18 40.62	23 38 17.6	12.5	4.7	0.34	23	22 28.5	4 36 9.00	19 16 35.7	9.6	3.6	0.26
10	1 9.6	4 20 12.65	23 33 24.1	12.8	4.9	0.35	24	22 29.7	4 41 18.21	19 37 28.8	9.3	3.5	0.25
11	1 6.8	4 21 23.40	23 26 32.2	13.1	5.0	0.36	25	22 31.2	4 46 44.03	19 58 35.4	9.1	3.5	0.25
12	1 3.7	4 22 13.02	+23 17 45.1	13.4	5.1	0.37	26	22 33.0	4 52 26.48	+20 19 46.3	8.9	3.4	0.24
13	1 0.2	4 22 41.83	23 7 6.4	13.7	5.2	0.38	27	22 35.0	4 58 25.59	20 40 51.7	8.7	3.3	0.24
14	0 56.4	4 22 50.30	22 54 40.2	14.0	5.3	0.38	28	22 37.3	5 4 41.38	21 1 41.5	8.6	3.2	0.23
15	0 52.3	4 22 39.09	22 40 31.3	14.3	5.4	0.39	29	22 39.9	5 11 13.80	21 22 5.1	8.4	3.2	0.23
16	0 47.9	4 22 9.07	22 24 45.3	14.6	5.5	0.40	30	22 42.8	5 18 2.76	21 41 51.7	8.2	3.1	0.22
17	0 43.2	4 21 21.33	+22 7 28.7	14.8	5.6	0.40	July 1	22 45.9	5 25 8.09	+22 0 49.9	8.0	3.1	0.22
18	0 38.2	4 20 17.16	+21 48 49.3	15.1	5.7	0.41	2	22 49.3	5 32 29.54	+22 18 47.9	7.9	3.0	0.22

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	22 45.9	5 25 8.09	+22 0 49.9	8.0	3.1	0.22	Aug. 17	1 34.5	11 15 31.33	+4 29 27.7	7.9	3.0	0.20
2	22 49.3	5 32 29.54	22 18 47.9	7.9	3.0	0.22	18	1 35.4	11 20 24.93	3 48 40.5	7.9	3.0	0.20
3	22 53.0	5 40 6.74	22 35 33.5	7.7	2.9	0.21	19	1 36.3	11 25 11.61	3 8 18.6	8.0	3.1	0.20
4	22 56.9	5 47 59.19	22 50 54.3	7.6	2.9	0.21	20	1 37.0	11 29 51.36	2 28 24.8	8.1	3.1	0.21
5	23 1.1	5 56 6.23	23 4 38.1	7.5	2.8	0.21	21	1 37.6	11 34 24.15	1 49 2.2	8.2	3.1	0.21
6	23 5.5	6 4 27.04	+23 16 33.0	7.4	2.8	0.20	22	1 38.1	11 38 49.89	+1 10 13.8	8.4	3.2	0.21
7	23 10.1	6 13 0.60	23 26 27.4	7.2	2.8	0.20	23	1 38.4	11 43 8.46	+0 32 2.8	8.5	3.2	0.21
8	23 14.9	6 21 45.71	23 34 10.4	7.1	2.7	0.20	24	1 38.7	11 47 19.72	-0 5 27.5	8.6	3.3	0.22
9	23 19.8	6 30 41.01	23 39 32.0	7.1	2.7	0.19	25	1 38.8	11 51 23.50	0 42 13.6	8.7	3.3	0.22
10	23 24.9	6 39 44.98	23 42 23.6	7.0	2.6	0.19	26	1 38.8	11 55 19.58	1 18 12.0	8.8	3.3	0.22
11	23 30.2	6 48 55.96	+23 42 38.4	6.9	2.6	0.19	27	1 38.7	11 59 7.68	-1 53 18.8	9.0	3.4	0.23
12	23 35.5	6 58 12.20	23 40 11.2	6.8	2.6	0.19	28	1 38.4	12 2 47.48	2 27 30.0	9.1	3.4	0.23
13	23 40.8	7 7 31.88	23 34 58.5	6.8	2.6	0.19	29	1 38.0	12 6 18.62	3 0 41.1	9.2	3.5	0.23
14	23 46.2	7 16 53.18	23 26 59.2	6.7	2.5	0.19	30	1 37.4	12 9 40.67	3 32 47.4	9.4	3.6	0.24
15	23 51.6	7 26 14.31	23 16 14.2	6.7	2.5	0.18	31	1 36.6	12 12 53.14	4 3 43.8	9.5	3.6	0.24
16	23 57.0	7 35 33.58	+23 2 46.2	6.6	2.5	0.18	Sept. 1	1 35.7	12 15 55.49	-4 33 24.6	9.7	3.7	0.25
18	0 2.3	7 44 49.42	22 46 39.3	6.6	2.5	0.18	2	1 34.7	12 18 47.14	5 1 43.8	9.8	3.7	0.25
19	0 7.5	7 54 0.40	22 27 59.3	6.6	2.5	0.18	3	1 33.4	12 21 27.41	5 28 34.8	10.0	3.8	0.25
20	0 12.7	8 3 5.26	22 6 53.3	6.6	2.5	0.18	4	1 31.9	12 23 55.55	5 53 50.5	10.2	3.9	0.26
21	0 17.7	8 12 2.93	21 43 29.2	6.6	2.5	0.18	5	1 30.2	12 26 10.76	6 17 23.0	10.4	3.9	0.26
22	0 22.5	8 20 52.49	+21 17 55.5	6.6	2.5	0.18	6	1 28.3	12 28 12.18	-6 39 3.6	10.6	4.0	0.27
23	0 27.3	8 29 33.23	20 50 21.2	6.6	2.5	0.18	7	1 26.2	12 29 58.85	6 58 43.1	10.8	4.1	0.27
24	0 31.8	8 38 4.59	20 20 55.3	6.6	2.5	0.18	8	1 23.7	12 31 29.78	7 16 11.4	11.0	4.2	0.28
25	0 36.2	8 46 26.15	19 49 46.9	6.6	2.5	0.18	9	1 21.0	12 32 43.92	7 31 17.7	11.2	4.2	0.28
26	0 40.5	8 54 37.64	19 17 4.9	6.6	2.5	0.18	10	1 18.0	12 33 40.22	7 43 50.2	11.4	4.3	0.29
27	0 44.5	9 2 38.91	+18 42 58.1	6.6	2.5	0.18	11	1 14.7	12 34 17.61	-7 53 36.5	11.6	4.4	0.30
28	0 48.4	9 10 29.90	18 7 34.9	6.7	2.5	0.18	12	1 11.1	12 34 35.01	8 0 23.8	11.8	4.5	0.30
29	0 52.2	9 18 10.60	17 31 3.2	6.7	2.5	0.18	13	1 7.1	12 34 31.40	8 3 58.6	12.0	4.6	0.31
30	0 55.7	9 25 41.10	16 53 30.5	6.7	2.6	0.18	14	1 2.7	12 34 5.88	8 4 7.4	12.2	4.6	0.31
31	0 59.1	9 33 1.54	16 15 3.9	6.8	2.6	0.18	15	0 58.0	12 33 17.74	8 0 37.1	12.5	4.7	0.32
Aug. 1	1 2.3	9 40 12.07	+15 35 50.1	6.8	2.6	0.18	16	0 52.9	12 32 6.51	-7 53 15.6	12.7	4.8	0.32
2	1 5.4	9 47 12.91	14 55 55.3	6.8	2.6	0.18	17	0 47.4	12 30 32.03	7 41 52.6	12.9	4.9	0.33
3	1 8.3	9 54 4.28	14 15 25.5	6.9	2.6	0.18	18	0 41.5	12 28 34.59	7 26 20.1	13.0	4.9	0.33
4	1 11.0	10 0 46.41	13 34 26.1	6.9	2.6	0.18	19	0 35.3	12 26 14.98	7 6 34.5	13.2	5.0	0.34
5	1 13.6	10 7 19.53	12 53 2.2	7.0	2.7	0.18	20	0 28.7	12 23 34.63	6 42 37.2	13.3	5.1	0.34
6	1 16.1	10 13 43.88	+12 11 18.6	7.1	2.7	0.18	21	0 21.8	12 20 35.65	-6 14 35.6	13.4	5.1	0.34
7	1 18.4	10 19 59.68	11 29 19.7	7.1	2.7	0.18	22	0 14.6	12 17 20.87	5 42 44.5	13.5	5.1	0.34
8	1 20.6	10 26 7.16	10 47 9.8	7.2	2.7	0.18	23	0 7.2	12 13 53.91	5 7 27.4	13.6	5.1	0.34
9	1 22.6	10 32 6.56	10 4 53.1	7.2	2.7	0.19	23	23 59.7	12 10 19.11	4 29 16.7	13.6	5.1	0.34
10	1 24.5	10 37 58.07	9 22 33.3	7.3	2.8	0.19	24	23 52.2	12 6 41.41	3 48 52.6	13.5	5.1	0.34
11	1 26.3	10 43 41.88	+ 8 40 13.8	7.4	2.8	0.19	25	23 44.7	12 3 6.22	-3 7 2.7	13.4	5.1	0.34
12	1 28.0	10 49 18.17	7 57 58.0	7.4	2.8	0.19	26	23 37.3	11 59 39.19	2 24 40.8	13.3	5.0	0.34
13	1 29.5	10 54 47.08	7 15 49.4	7.5	2.9	0.19	27	23 30.1	11 56 26.04	1 42 43.6	13.1	5.0	0.33
14	1 30.6	11 0 8.75	6 33 51.1	7.6	2.9	0.19	28	23 23.3	11 53 32.22	1 2 8.6	12.9	4.9	0.33
15	1 32.2	11 5 23.29	5 52 6.0	7.7	2.9	0.20	29	23 16.9	11 51 2.72	-0 23 50.8	12.6	4.8	0.32
16	1 33.4	11 10 30.80	+ 5 10 37.2	7.8	2.9	0.20	30	23 11.0	11 49 1.85	+0 11 19.4	12.3	4.7	0.31
17	1 34.5	11 15 31.33	+ 4 29 27.7	7.9	3.0	0.20	Oct. 1	23 5.6	11 47 33.07	+0 42 38.4	12.0	4.6	0.30

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	23 5.6	11 47 33.07	+ 0 42 38.4	12.0	4.6	0.30	Nov. 15	23 54.0	15 33 35.05	-19 44 57.0	6.1	2.3	0.16
2	23 0.7	11 46 38.95	1 9 31.0	11.7	4.4	0.30	16	23 56.5	15 40 0.88	20 13 16.1	6.1	2.3	0.16
3	22 56.5	11 46 21.10	1 31 30.4	11.4	4.3	0.29	17	23 59.0	15 46 28.08	20 40 35.2	6.1	2.3	0.16
4	22 52.9	11 46 40.18	1 48 19.0	11.0	4.2	0.28	19	0 1.6	15 52 56.70	21 6 52.9	6.1	2.3	0.17
5	22 50.0	11 47 35.99	1 59 47.6	10.7	4.1	0.27	20	0 4.1	15 59 26.78	21 32 8.1	6.1	2.3	0.17
6	22 47.5	11 49 7.59	+ 2 5 55.0	10.3	3.9	0.26	21	0 6.7	16 5 58.33	-21 56 19.4	6.1	2.3	0.17
7	22 45.6	11 51 13.41	2 6 46.1	10.0	3.8	0.25	22	0 9.3	16 12 31.38	22 19 25.3	6.1	2.3	0.17
8	22 44.3	11 53 51.35	2 2 31.6	9.7	3.7	0.25	23	0 11.9	16 19 5.93	22 41 24.3	6.1	2.3	0.17
9	22 43.5	11 56 59.00	1 53 27.0	9.4	3.6	0.24	24	0 14.6	16 25 41.96	23 2 15.1	6.2	2.3	0.17
10	22 43.1	12 0 33.73	1 39 51.0	9.1	3.5	0.23	25	0 17.2	16 32 19.45	23 21 56.3	6.2	2.3	0.17
11	22 43.2	12 4 32.78	+ 1 22 4.4	8.9	3.4	0.22	26	0 19.9	16 38 58.37	-23 40 26.4	6.2	2.4	0.17
12	22 43.6	12 8 53.36	1 0 29.7	8.6	3.3	0.22	27	0 22.7	16 45 38.66	23 57 44.0	6.2	2.4	0.17
13	22 44.3	12 13 32.81	0 35 29.8	8.4	3.2	0.21	28	0 25.4	16 52 20.25	24 13 47.6	6.3	2.4	0.17
14	22 45.3	12 18 28.61	+ 0 7 27.6	8.2	3.1	0.21	29	0 28.2	16 59 3.03	24 28 35.8	6.3	2.4	0.17
15	22 46.5	12 23 38.41	- 0 23 14.5	8.0	3.0	0.20	30	0 30.9	17 5 46.88	24 42 7.1	6.3	2.4	0.18
16	22 47.9	12 29 0.05	- 0 56 15.1	7.8	3.0	0.20	Dec. 1	0 33.7	17 12 31.67	-24 54 20.0	6.4	2.4	0.18
17	22 49.5	12 34 31.62	1 31 14.2	7.7	2.9	0.19	2	0 36.5	17 19 17.25	25 5 13.3	6.4	2.4	0.18
18	22 51.2	12 40 11.46	2 7 53.1	7.5	2.9	0.19	3	0 39.4	17 26 3.43	25 14 45.7	6.4	2.4	0.18
19	22 53.0	12 45 58.11	2 45 54.8	7.4	2.8	0.19	4	0 42.2	17 32 49.97	25 22 55.8	6.5	2.5	0.18
20	22 55.0	12 51 50.31	3 25 3.7	7.3	2.8	0.18	5	0 45.0	17 39 36.61	25 29 42.1	6.5	2.5	0.18
21	22 57.0	12 57 47.00	- 4 5 5.6	7.1	2.7	0.18	6	0 47.8	17 46 23.08	-25 35 3.5	6.6	2.5	0.19
22	22 59.0	13 3 47.31	4 45 48.2	7.0	2.7	0.18	7	0 50.7	17 53 9.05	25 38 59.0	6.7	2.5	0.19
23	23 1.1	13 9 50.50	5 27 0.3	6.9	2.6	0.18	8	0 53.5	17 59 54.14	25 41 27.4	6.7	2.6	0.19
24	23 3.3	13 15 55.96	6 8 31.7	6.8	2.6	0.17	9	0 56.2	18 6 37.93	25 42 27.9	6.8	2.6	0.19
25	23 5.4	13 22 3.21	6 50 13.5	6.8	2.6	0.17	10	0 59.0	18 13 19.92	25 41 59.7	6.9	2.6	0.19
26	23 7.6	13 28 11.88	- 7 31 58.1	6.7	2.5	0.17	11	1 1.7	18 19 59.57	-25 40 2.3	7.0	2.6	0.20
27	23 9.8	13 34 21.67	8 13 38.7	6.6	2.5	0.17	12	1 4.4	18 26 36.27	25 36 35.5	7.1	2.7	0.20
28	23 12.1	13 40 32.33	8 55 9.1	6.5	2.5	0.17	13	1 7.0	18 33 9.30	25 31 39.3	7.2	2.7	0.20
29	23 14.3	13 46 43.70	9 36 23.9	6.5	2.5	0.17	14	1 9.5	18 39 37.88	25 25 13.8	7.3	2.8	0.20
30	23 16.6	13 52 55.68	10 17 18.5	6.4	2.4	0.17	15	1 11.9	18 46 1.14	25 17 19.8	7.4	2.8	0.21
31	23 18.8	13 59 8.20	-10 57 48.6	6.4	2.4	0.16	16	1 14.3	18 52 18.07	-25 7 58.6	7.5	2.8	0.21
Nov. 1	23 21.1	14 5 21.21	11 37 50.4	6.3	2.4	0.16	17	1 16.5	18 58 27.51	24 57 11.8	7.6	2.9	0.21
2	23 23.4	14 11 34.71	12 17 20.5	6.3	2.4	0.16	18	1 18.5	19 4 28.18	24 45 1.7	7.7	2.9	0.22
3	23 25.7	14 17 48.70	12 56 15.9	6.3	2.4	0.16	19	1 20.4	19 10 18.64	24 31 31.5	7.9	3.0	0.22
4	23 28.0	14 24 3.21	13 34 34.0	6.2	2.4	0.16	20	1 22.1	19 15 57.22	24 16 45.1	8.0	3.1	0.22
5	23 30.3	14 30 18.29	-14 12 12.2	6.2	2.4	0.16	21	1 23.6	19 21 22.08	-24 0 47.5	8.2	3.1	0.23
6	23 32.6	14 36 34.00	14 49 8.3	6.2	2.3	0.16	22	1 24.8	19 26 31.16	23 43 44.7	8.4	3.2	0.23
7	23 34.9	14 42 50.40	15 25 20.3	6.2	2.3	0.16	23	1 25.7	19 31 22.14	23 25 43.8	8.6	3.3	0.24
8	23 37.2	14 49 7.56	16 0 46.3	6.1	2.3	0.16	24	1 26.3	19 35 52.44	23 6 53.6	8.8	3.3	0.24
9	23 39.6	14 55 25.55	16 35 24.4	6.1	2.3	0.16	25	1 26.4	19 39 59.22	22 47 24.4	9.0	3.4	0.25
10	23 41.9	15 1 44.44	-17 9 12.9	6.1	2.3	0.16	26	1 26.2	19 43 39.42	-22 27 27.7	9.3	3.5	0.25
11	23 44.3	15 8 4.32	17 42 10.1	6.1	2.3	0.16	27	1 25.4	19 46 49.75	22 7 16.4	9.5	3.6	0.26
12	23 46.7	15 14 25.25	18 14 14.5	6.1	2.3	0.16	28	1 24.1	19 49 26.74	21 47 5.2	9.8	3.7	0.27
13	23 49.1	15 20 47.30	18 45 24.8	6.1	2.3	0.16	29	1 22.1	19 51 26.84	21 27 10.0	10.1	3.8	0.28
14	23 51.6	15 27 10.54	19 15 39.4	6.1	2.3	0.16	30	1 19.5	19 52 46.58	21 7 47.3	10.4	4.0	0.28
15	23 54.0	15 33 35.05	-19 44 57.0	6.1	2.3	0.16	31	1 16.2	19 53 22.70	-20 49 13.8	10.7	4.1	0.29
16	23 56.5	15 40 0.88	-20 13 16.1	6.1	2.3	0.16	32	1 12.1	19 53 12.44	-20 31 46.3	11.1	4.2	0.30

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	3 2.0	21 40 24.28	-14 8 41.3	19.2	18.7	1.29	Feb. 14	23 43.4	21 22 36.39	-6 28 18.9	32.0	31.1	2.08
1	3 0.4	21 42 46.41	13 47 14.5	19.5	19.0	1.31	15	23 37.2	21 20 20.20	6 37 14.1	31.9	31.0	2.07
2	2 58.7	21 45 2.88	13 25 51.8	19.8	19.2	1.32	16	23 31.1	21 18 9.05	6 46 38.7	31.7	30.8	2.06
3	2 57.0	21 47 13.55	13 4 34.5	20.1	19.5	1.34	17	23 25.0	21 16 3.72	6 56 28.5	31.5	30.6	2.05
4	2 55.1	21 49 18.26	12 43 24.2	20.4	19.8	1.35	18	23 19.1	21 14 4.92	7 6 39.0	31.3	30.4	2.04
5	2 53.2	21 51 16.82	-12 22 22.5	20.7	20.1	1.37	19	23 13.3	21 12 13.33	-7 17 5.9	31.0	30.1	2.02
6	2 51.1	21 53 9.03	12 1 31.0	21.1	20.4	1.39	20	23 7.7	21 10 29.58	7 27 44.9	30.7	29.8	2.00
7	2 48.9	21 54 54.70	11 40 51.3	21.4	20.7	1.42	21	23 2.2	21 8 54.17	7 38 31.9	30.4	29.5	1.98
8	2 46.6	21 56 33.66	11 20 25.0	21.7	21.1	1.44	22	22 56.8	21 7 27.54	7 49 22.6	30.1	29.2	1.96
9	2 44.2	21 58 5.73	11 0 14.0	22.0	21.4	1.46	23	22 51.6	21 6 10.09	8 0 13.1	29.8	28.9	1.94
10	2 41.7	21 59 30.72	-10 40 20.1	22.4	21.8	1.48	24	22 46.5	21 5 2.11	-8 10 59.8	29.4	28.5	1.92
11	2 39.1	22 0 48.40	10 20 45.2	22.8	22.1	1.50	25	22 41.6	21 4 3.83	8 21 39.3	29.0	28.2	1.90
12	2 36.3	22 1 58.55	10 1 31.3	23.1	22.5	1.52	26	22 36.9	21 3 15.40	8 32 8.4	28.6	27.8	1.87
13	2 33.4	22 3 0.95	9 42 40.5	23.5	22.8	1.54	27	22 32.3	21 2 36.93	8 42 24.3	28.2	27.4	1.85
14	2 30.4	22 3 55.39	9 24 14.8	23.9	23.2	1.57	28	22 27.9	21 2 8.46	8 52 24.3	27.8	27.0	1.82
15	2 27.2	22 4 41.66	-9 6 16.4	24.3	23.6	1.59	Mar. 1	22 23.7	21 1 49.98	-9 2 5.7	27.4	26.6	1.80
16	2 23.9	22 5 19.54	8 48 47.4	24.7	24.0	1.62	2	22 19.6	21 1 41.42	9 11 26.3	27.0	26.2	1.77
17	2 20.5	22 5 48.83	8 31 50.2	25.1	24.3	1.64	3	22 15.7	21 1 42.67	9 20 24.1	26.6	25.8	1.75
18	2 16.9	22 6 9.32	8 15 27.2	25.5	24.7	1.66	4	22 11.9	21 1 53.60	9 28 57.2	26.2	25.5	1.73
19	2 13.2	22 6 20.85	7 59 40.8	25.9	25.1	1.69	5	22 8.3	21 2 14.05	9 37 4.1	25.8	25.1	1.70
20	2 9.3	22 6 23.27	-7 44 33.5	26.3	25.5	1.72	6	22 4.9	21 2 43.82	-9 44 43.3	25.4	24.7	1.67
21	2 5.2	22 6 16.42	7 30 7.7	26.7	25.9	1.75	7	22 1.6	21 3 22.67	9 51 53.5	25.0	24.3	1.64
22	2 1.0	22 6 0.21	7 16 25.6	27.1	26.3	1.77	8	21 58.5	21 4 10.36	9 58 33.6	24.6	23.9	1.62
23	1 56.6	22 5 34.57	7 3 29.5	27.5	26.7	1.80	9	21 55.5	21 5 6.62	10 4 42.6	24.2	23.5	1.59
24	1 52.1	22 4 59.48	6 51 21.9	27.9	27.1	1.82	10	21 52.6	21 6 11.20	10 10 19.8	23.8	23.1	1.57
25	1 47.4	22 4 14.94	-6 40 5.1	28.3	27.5	1.84	11	21 49.9	21 7 23.84	-10 15 24.5	23.4	22.7	1.54
26	1 42.6	22 3 21.00	6 29 41.3	28.7	27.8	1.86	12	21 47.3	21 8 44.25	10 19 56.1	23.0	22.4	1.52
27	1 37.7	22 2 17.76	6 20 12.3	29.1	28.2	1.89	13	21 44.8	21 10 12.15	10 23 54.1	22.6	22.0	1.49
28	1 32.5	22 1 5.38	6 11 39.9	29.4	28.5	1.91	14	21 42.5	21 11 47.28	10 27 18.2	22.3	21.6	1.47
29	1 27.2	21 59 44.08	6 4 5.8	29.8	28.9	1.93	15	21 40.3	21 13 29.39	10 30 7.9	21.9	21.2	1.44
30	1 21.8	21 58 14.15	-5 57 31.8	30.1	29.2	1.95	16	21 38.1	21 15 18.21	-10 32 23.0	21.6	20.9	1.42
31	1 16.2	21 56 35.94	5 51 59.2	30.4	29.6	1.98	17	21 36.1	21 17 13.48	10 34 3.1	21.2	20.6	1.40
Feb. 1	1 10.5	21 54 49.86	5 47 28.9	30.7	29.9	2.00	18	21 34.2	21 19 14.94	10 35 8.0	20.9	20.3	1.38
2	1 4.7	21 52 56.39	5 44 1.6	31.0	30.2	2.02	19	21 32.4	21 21 22.35	10 35 37.5	20.5	19.9	1.35
3	0 58.8	21 50 56.07	5 41 37.5	31.3	30.4	2.03	20	21 30.7	21 23 35.46	10 35 31.5	20.2	19.6	1.33
4	0 52.8	21 48 49.54	-5 40 16.6	31.5	30.6	2.04	21	21 29.0	21 25 54.04	-10 34 49.9	19.9	19.3	1.31
5	0 46.6	21 46 37.48	5 39 58.5	31.6	30.7	2.05	22	21 27.5	21 28 17.88	10 33 32.7	19.6	19.0	1.29
6	0 40.4	21 44 20.63	5 40 42.4	31.8	30.9	2.07	23	21 26.0	21 30 46.75	10 31 40.1	19.3	18.7	1.27
7	0 34.2	21 41 59.79	5 42 27.0	32.0	31.1	2.08	24	21 24.6	21 33 20.43	10 29 12.0	19.0	18.4	1.23
8	0 27.9	21 39 35.79	5 45 10.7	32.1	31.2	2.09	25	21 23.3	21 35 58.69	10 26 8.5	18.7	18.1	1.23
9	0 21.5	21 37 9.53	-5 48 51.6	32.2	31.3	2.09	26	21 22.1	21 38 41.32	-10 22 29.6	18.4	17.9	1.21
10	0 15.1	21 34 41.92	5 53 27.3	32.3	31.3	2.09	27	21 21.0	21 41 28.12	10 18 15.5	18.1	17.6	1.19
11	0 8.7	21 32 13.90	5 58 55.0	32.3	31.3	2.09	28	21 19.9	21 44 18.91	10 13 26.5	17.8	17.3	1.17
12	0 2.3	21 29 46.41	6 5 11.5	32.3	31.3	2.09	29	21 18.9	21 47 13.50	10 8 2.8	17.5	17.0	1.15
12	23 55.9	21 27 20.39	6 12 13.5	32.2	31.3	2.08	30	21 17.9	21 50 11.71	10 2 4.7	17.3	16.8	1.14
13	23 49.6	21 24 56.75	-6 19 57.3	32.1	31.3	2.08	31	21 17.0	21 53 13.34	-9 55 32.6	17.0	16.5	1.12
14	23 43.4	21 22 36.39	-6 28 18.9	32.0	31.1	2.08	Apr. 1	21 16.1	21 56 18.24	-9 48 26.7	16.8	16.3	1.10

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	21 16.1	21 56 18.24	-9 48 26.7	16.8	16.3	1.10	May 17	21 6.4	0 47 52.46	+ 3 13 3.7	9.9	9.6	0.64
2	21 15.3	21 59 26.24	9 40 47.4	16.6	16.1	1.09	18	21 6.5	0 51 57.20	3 36 2.6	9.9	9.5	0.63
3	21 14.5	22 2 37.19	9 32 35.1	16.3	15.9	1.08	19	21 6.6	0 56 2.64	3 59 6.0	9.8	9.4	0.63
4	21 13.8	22 5 50.91	9 23 50.2	16.1	15.7	1.06	20	21 6.8	1 0 8.79	4 22 13.4	9.7	9.3	0.62
5	21 13.2	22 9 7.27	9 14 33.3	15.9	15.4	1.04	21	21 7.0	1 4 15.67	4 45 24.1	9.6	9.2	0.62
6	21 12.5	22 12 26.13	-9 4 44.7	15.7	15.2	1.02	22	21 7.2	1 8 23.28	+ 5 8 37.3	9.5	9.2	0.61
7	21 11.9	22 15 47.35	8 54 24.9	15.5	15.0	1.01	23	21 7.3	1 12 31.65	5 31 52.4	9.4	9.1	0.61
8	21 11.4	22 19 10.80	8 43 34.5	15.2	14.8	1.00	24	21 7.5	1 16 40.79	5 55 8.7	9.3	9.0	0.61
9	21 10.9	22 22 36.35	8 32 14.7	15.0	14.6	0.99	25	21 7.8	1 20 50.72	6 18 25.5	9.3	9.0	0.61
10	21 10.4	22 26 3.90	8 20 24.4	14.8	14.4	0.97	26	21 8.0	1 25 1.45	6 41 42.2	9.2	9.0	0.60
11	21 9.9	22 29 33.34	-8 8 5.8	14.7	14.2	0.96	27	21 8.3	1 29 13.00	+ 7 4 58.1	9.1	8.9	0.60
12	21 9.5	22 33 4.57	7 55 18.8	14.5	14.0	0.95	28	21 8.5	1 33 25.39	7 28 12.5	9.1	8.8	0.59
13	21 9.1	22 36 37.49	7 42 4.1	14.3	13.9	0.94	29	21 8.8	1 37 38.63	7 51 24.5	9.0	8.7	0.59
14	21 8.8	22 40 12.02	7 28 22.1	14.1	13.7	0.92	30	21 9.1	1 41 52.74	8 14 33.5	9.0	8.7	0.58
15	21 8.4	22 43 48.09	7 14 13.3	13.9	13.5	0.91	31	21 9.4	1 46 7.73	8 37 39.0	8.9	8.6	0.58
16	21 8.1	22 47 25.63	-6 59 38.3	13.7	13.3	0.90	June 1	21 9.7	1 50 23.61	+ 9 0 40.1	8.8	8.5	0.58
17	21 7.8	22 51 4.57	6 44 37.7	13.6	13.2	0.89	2	21 10.1	1 54 40.39	9 23 36.0	8.7	8.5	0.58
18	21 7.5	22 54 44.83	6 29 12.1	13.4	13.0	0.88	3	21 10.4	1 58 58.10	9 46 26.0	8.7	8.4	0.57
19	21 7.3	22 58 26.37	6 13 22.0	13.2	12.9	0.87	4	21 10.8	2 3 16.76	10 9 9.4	8.6	8.4	0.57
20	21 7.1	23 2 9.12	5 57 7.9	13.1	12.7	0.86	5	21 11.2	2 7 36.37	10 31 45.4	8.5	8.3	0.56
21	21 6.9	23 5 53.03	-5 40 30.5	13.0	12.6	0.85	6	21 11.6	2 11 56.94	+10 54 13.4	8.5	8.2	0.56
22	21 6.7	23 9 38.05	5 23 30.3	12.8	12.4	0.83	7	21 12.0	2 16 18.49	11 16 32.5	8.4	8.2	0.55
23	21 6.5	23 13 24.13	5 6 7.9	12.7	12.3	0.82	8	21 12.4	2 20 41.02	11 38 42.0	8.4	8.1	0.55
24	21 6.3	23 17 11.23	4 48 24.0	12.5	12.1	0.81	9	21 12.8	2 25 4.56	12 0 41.3	8.3	8.1	0.55
25	21 6.2	23 20 59.31	4 30 19.2	12.4	12.0	0.80	10	21 13.3	2 29 29.13	12 22 29.5	8.2	8.0	0.55
26	21 6.1	23 24 48.34	-4 11 54.1	12.2	11.9	0.79	11	21 13.8	2 33 54.73	+12 44 6.1	8.2	8.0	0.54
27	21 6.0	23 28 38.28	3 53 9.3	12.1	11.8	0.79	12	21 14.3	2 38 21.38	13 5 30.3	8.1	7.9	0.54
28	21 5.9	23 32 29.10	3 34 5.5	11.9	11.6	0.78	13	21 14.8	2 42 49.11	13 26 41.4	8.1	7.8	0.54
29	21 5.8	23 36 20.76	3 14 43.3	11.8	11.5	0.77	14	21 15.3	2 47 17.93	13 47 38.6	8.0	7.8	0.54
30	21 5.7	23 40 13.23	2 55 3.5	11.7	11.4	0.76	15	21 15.9	2 51 47.85	14 8 21.4	7.9	7.7	0.53
May 1	21 5.6	23 44 6.49	-2 35 6.6	11.6	11.3	0.76	16	21 16.5	2 56 18.88	+14 28 49.0	7.9	7.7	0.53
2	21 5.6	23 48 0.52	2 14 53.3	11.5	11.1	0.75	17	21 17.1	3 0 51.04	14 49 0.9	7.8	7.6	0.53
3	21 5.6	23 51 55.29	1 54 24.4	11.4	11.0	0.74	18	21 17.7	3 5 24.35	15 8 56.3	7.8	7.6	0.53
4	21 5.6	23 55 50.77	1 33 40.5	11.2	10.9	0.73	19	21 18.3	3 9 58.82	15 28 34.3	7.7	7.5	0.52
5	21 5.6	23 59 46.96	1 12 42.4	11.1	10.8	0.72	20	21 19.0	3 14 34.46	15 47 54.3	7.7	7.5	0.52
6	21 5.6	0 3 43.84	-0 51 30.9	11.0	10.7	0.71	21	21 19.6	3 19 11.27	+16 6 55.7	7.7	7.5	0.52
7	21 5.6	0 7 41.40	0 30 6.6	10.9	10.6	0.71	22	21 20.3	3 23 49.27	16 25 37.8	7.6	7.4	0.52
8	21 5.6	0 11 39.61	-0 8 30.3	10.8	10.5	0.70	23	21 21.0	3 28 28.46	16 43 59.8	7.6	7.4	0.51
9	21 5.7	0 15 38.46	+0 13 17.3	10.7	10.4	0.70	24	21 21.7	3 33 8.84	17 2 1.2	7.5	7.3	0.51
10	21 5.7	0 19 37.95	0 35 15.6	10.6	10.3	0.69	25	21 22.5	3 37 50.43	17 19 41.2	7.5	7.3	0.51
11	21 5.8	0 23 38.08	+0 57 23.8	10.5	10.2	0.68	26	21 23.3	3 42 33.22	+17 36 59.0	7.4	7.2	0.51
12	21 5.8	0 27 38.84	1 19 41.2	10.4	10.1	0.67	27	21 24.1	3 47 17.21	17 53 54.1	7.4	7.2	0.51
13	21 5.9	0 31 40.25	1 42 7.3	10.3	10.0	0.67	28	21 24.9	3 52 2.41	18 10 25.7	7.4	7.2	0.51
14	21 6.0	0 35 42.31	2 4 41.3	10.2	9.9	0.66	29	21 25.7	3 56 48.81	18 26 33.1	7.4	7.1	0.50
15	21 6.1	0 39 45.03	2 27 22.4	10.1	9.8	0.66	30	21 26.5	4 1 36.40	18 42 15.7	7.3	7.1	0.50
16	21 6.2	0 43 48.41	+2 50 10.1	10.0	9.7	0.65	July 1	21 27.4	4 6 25.16	+18 57 32.8	7.2	7.0	0.50
17	21 6.4	0 47 52.46	+3 13 3.7	9.9	9.6	0.64	2	21 28.3	4 11 15.09	+19 12 23.7	7.2	7.0	0.50

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 1	21 27.4	4 6 25.16	+18 57 32.8	7.2	7.0	0.50	Aug. 16	22 20.2	8 0 44.03	+20 41 21.7	6.0	5.8	0.41
2	21 28.3	4 11 15.09	19 12 23.7	7.2	7.0	0.50	17	22 21.4	8 5 50.90	20 29 12.3	5.9	5.8	0.41
3	21 29.2	4 16 6.16	19 26 47.7	7.2	7.0	0.50	18	22 22.5	8 10 57.14	20 16 27.6	5.9	5.8	0.41
4	21 30.1	4 20 58.37	19 40 44.2	7.2	7.0	0.49	19	22 23.7	8 16 2.71	20 3 7.9	5.9	5.7	0.41
5	21 31.1	4 25 51.69	19 54 12.5	7.1	6.9	0.49	20	22 24.8	8 21 7.60	19 49 13.5	5.9	5.7	0.41
6	21 32.0	4 30 46.11	+20 7 12.1	7.1	6.9	0.49	21	22 26.0	8 26 11.77	+19 34 44.8	5.9	5.7	0.40
7	21 33.0	4 35 41.60	20 19 42.3	7.0	6.8	0.49	22	22 27.1	8 31 15.20	19 19 42.2	5.9	5.7	0.40
8	21 34.0	4 40 38.14	20 31 42.5	7.0	6.8	0.49	23	22 28.2	8 36 17.88	19 4 6.3	5.8	5.7	0.40
9	21 35.0	4 45 35.70	20 43 12.2	7.0	6.8	0.49	24	22 29.3	8 41 19.78	18 47 57.6	5.8	5.6	0.40
10	21 36.1	4 50 34.27	20 54 10.7	7.0	6.7	0.48	25	22 30.3	8 46 20.88	18 31 16.4	5.8	5.6	0.39
11	21 37.1	4 55 33.82	+21 4 37.6	6.9	6.7	0.48	26	22 31.4	8 51 21.17	+18 14 3.3	5.8	5.6	0.39
12	21 38.2	5 0 34.32	21 14 32.3	6.9	6.7	0.47	27	22 32.4	8 56 20.64	17 56 18.9	5.8	5.6	0.39
13	21 39.2	5 5 35.74	21 23 54.4	6.8	6.6	0.47	28	22 33.5	9 1 19.27	17 38 3.6	5.7	5.6	0.39
14	21 40.3	5 10 38.06	21 32 43.3	6.8	6.6	0.47	29	22 34.5	9 6 17.04	17 19 18.1	5.7	5.6	0.39
15	21 41.4	5 15 41.24	21 40 58.7	6.8	6.6	0.47	30	22 35.5	9 11 13.94	17 0 2.9	5.7	5.6	0.39
16	21 42.6	5 20 45.25	+21 48 40.0	6.7	6.5	0.47	31	22 36.5	9 16 9.96	+16 40 18.6	5.7	5.5	0.38
17	21 43.7	5 25 50.06	21 55 46.7	6.7	6.5	0.47	Sept. 1	22 37.5	9 21 5.10	16 20 5.8	5.7	5.5	0.38
18	21 44.8	5 30 55.63	22 2 18.5	6.7	6.5	0.47	2	22 38.4	9 25 59.35	15 59 25.2	5.7	5.5	0.38
19	21 46.0	5 36 1.91	22 8 14.9	6.6	6.5	0.47	3	22 39.4	9 30 52.71	15 38 17.3	5.7	5.5	0.38
20	21 47.2	5 41 8.87	22 13 35.7	6.6	6.4	0.46	4	22 40.3	9 35 45.18	15 16 42.8	5.6	5.5	0.38
21	21 48.4	5 46 16.48	+22 18 20.4	6.6	6.4	0.46	5	22 41.2	9 40 36.77	+14 54 42.3	5.6	5.5	0.38
22	21 49.5	5 51 24.69	22 22 28.8	6.6	6.4	0.46	6	22 42.1	9 45 27.47	14 32 16.6	5.6	5.5	0.37
23	21 50.7	5 56 33.46	22 26 0.6	6.5	6.3	0.46	7	22 43.0	9 50 17.30	14 9 26.3	5.6	5.4	0.37
24	21 52.0	6 1 42.75	22 28 55.3	6.5	6.3	0.46	8	22 43.9	9 55 6.27	13 46 12.0	5.6	5.4	0.37
25	21 53.2	6 6 52.51	22 31 12.8	6.5	6.3	0.46	9	22 44.7	9 59 54.38	13 22 34.3	5.6	5.4	0.37
26	21 54.4	6 12 2.70	+22 32 52.8	6.4	6.3	0.45	10	22 45.5	10 4 41.65	+12 58 34.0	5.6	5.4	0.37
27	21 55.6	6 17 13.26	22 33 55.1	6.4	6.2	0.45	11	22 46.4	10 9 28.09	12 34 11.7	5.6	5.4	0.37
28	21 56.9	6 22 24.14	22 34 19.6	6.4	6.2	0.45	12	22 47.2	10 14 13.72	12 9 28.2	5.5	5.4	0.37
29	21 58.1	6 27 35.29	22 34 6.0	6.4	6.2	0.45	13	22 48.0	10 18 58.57	11 44 24.1	5.5	5.4	0.37
30	21 59.3	6 32 46.67	22 33 14.1	6.3	6.2	0.44	14	22 48.8	10 23 42.65	11 19 0.1	5.5	5.4	0.37
31	22 0.6	6 37 58.22	+22 31 44.0	6.3	6.1	0.44	15	22 49.6	10 28 25.99	+10 53 16.9	5.5	5.3	0.36
Aug. 1	22 1.8	6 43 9.88	22 29 35.5	6.3	6.1	0.44	16	22 50.3	10 33 8.60	10 27 15.2	5.5	5.3	0.36
2	22 3.1	6 48 21.60	22 26 48.6	6.3	6.1	0.44	17	22 51.1	10 37 50.51	10 0 55.6	5.5	5.3	0.36
3	22 4.3	6 53 33.33	22 23 23.3	6.2	6.1	0.43	18	22 51.8	10 42 31.75	9 34 18.7	5.5	5.3	0.36
4	22 5.6	6 58 45.01	22 19 19.5	6.2	6.0	0.43	19	22 52.5	10 47 12.36	9 7 25.4	5.5	5.3	0.36
5	22 6.8	7 3 56.59	+22 14 37.4	6.2	6.0	0.43	20	22 53.3	10 51 52.35	+8 40 16.3	5.5	5.3	0.36
6	22 8.1	7 9 8.02	22 9 17.0	6.2	6.0	0.43	21	22 54.0	10 56 31.75	8 12 52.1	5.4	5.3	0.36
7	22 9.3	7 14 19.26	22 3 18.4	6.1	6.0	0.43	22	22 54.7	11 1 10.61	7 45 13.5	5.4	5.3	0.36
8	22 10.6	7 19 30.25	21 56 41.8	6.1	5.9	0.43	23	22 55.4	11 5 48.95	7 17 21.1	5.4	5.3	0.36
9	22 11.8	7 24 40.94	21 49 27.2	6.1	5.9	0.42	24	22 56.1	11 10 26.80	6 49 15.7	5.4	5.3	0.35
10	22 13.0	7 29 51.30	+21 41 34.8	6.1	5.9	0.42	25	22 56.8	11 15 4.20	+6 20 58.1	5.4	5.2	0.35
11	22 14.2	7 35 1.27	21 33 5.0	6.1	5.9	0.42	26	22 57.4	11 19 41.18	5 52 29.0	5.4	5.2	0.35
12	22 15.4	7 40 10.82	21 23 58.0	6.0	5.9	0.42	27	22 58.1	11 24 17.77	5 23 49.0	5.4	5.2	0.35
13	22 16.6	7 45 19.91	21 14 13.8	6.0	5.8	0.42	28	22 58.8	11 28 54.00	4 54 58.8	5.4	5.2	0.35
14	22 17.8	7 50 28.50	21 3 52.8	6.0	5.8	0.42	29	22 59.4	11 33 29.90	4 25 59.3	5.4	5.2	0.35
15	22 19.0	7 55 36.55	+20 52 55.3	6.0	5.8	0.41	30	23 0.0	11 38 5.50	+3 56 51.2	5.4	5.2	0.35
16	22 20.2	8 0 44.03	+20 41 21.7	6.0	5.8	0.41	Oct. 1	23 0.7	11 42 40.83	+3 27 35.2	5.4	5.2	0.35



## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	23 0.7	11 42 40.83	+ 3 27 35.2	5.4	5.2	0.35	Nov. 16	23 36.7	15 20 9.46	-17 43 39.7	5.1	5.0	0.35
2	23 1.3	11 47 15.94	2 58 12.0	5.3	5.2	0.35	17	23 37.8	15 25 14.08	18 4 47.2	5.1	5.0	0.35
3	23 2.0	11 51 50.88	2 28 42.5	5.3	5.2	0.35	18	23 39.0	15 30 19.94	18 25 25.4	5.1	5.0	0.35
4	23 2.6	11 56 25.67	1 59 7.4	5.3	5.2	0.35	19	23 40.2	15 35 27.03	18 45 33.5	5.1	5.0	0.35
5	23 3.3	12 1 0.35	1 29 27.3	5.3	5.2	0.35	20	23 41.4	15 40 35.36	19 5 10.7	5.1	5.0	0.35
6	23 3.9	12 5 34.96	+ 0 59 43.0	5.3	5.2	0.35	21	23 42.6	15 45 44.93	-19 24 16.4	5.1	5.0	0.36
7	23 4.5	12 10 9.53	0 29 55.3	5.3	5.2	0.35	22	23 43.8	15 50 55.73	19 42 49.8	5.1	5.0	0.36
8	23 5.1	12 14 44.10	+ 0 0 5.0	5.3	5.1	0.34	23	23 45.1	15 56 7.74	20 0 50.1	5.1	5.0	0.36
9	23 5.8	12 19 18.71	- 0 29 47.3	5.3	5.1	0.34	24	23 46.4	16 1 20.95	20 18 16.6	5.1	5.0	0.36
10	23 6.4	12 23 53.41	0 59 40.7	5.3	5.1	0.34	25	23 47.6	16 6 35.34	20 35 8.6	5.1	5.0	0.36
11	23 7.0	12 28 28.23	- 1 29 34.6	5.3	5.1	0.34	26	23 48.9	16 11 50.90	-20 51 25.4	5.1	5.0	0.36
12	23 7.7	12 33 3.22	1 59 28.2	5.3	5.1	0.34	27	23 50.3	16 17 7.60	21 7 6.1	5.1	5.0	0.36
13	23 8.3	12 37 38.41	2 29 20.8	5.3	5.1	0.34	28	23 51.6	16 22 25.42	21 22 10.3	5.1	5.0	0.36
14	23 9.0	12 42 13.84	2 59 11.6	5.3	5.1	0.34	29	23 53.0	16 27 44.33	21 36 37.2	5.1	5.0	0.36
15	23 9.6	12 46 49.56	3 28 59.9	5.3	5.1	0.34	30	23 54.4	16 33 4.28	21 50 26.2	5.1	5.0	0.36
16	23 10.3	12 51 25.62	- 3 58 44.9	5.2	5.1	0.34	Dec. 1	23 55.8	16 38 25.25	-22 3 36.7	5.1	5.0	0.36
17	23 10.9	12 56 2.05	4 28 25.9	5.2	5.1	0.34	2	23 57.2	16 43 47.21	22 16 8.2	5.1	5.0	0.36
18	23 11.6	13 0 38.90	4 58 2.1	5.2	5.1	0.34	3	23 58.6	16 49 10.12	22 28 0.1	5.1	5.0	0.36
19	23 12.3	13 5 16.21	5 27 32.9	5.2	5.1	0.34	5	0 0.1	16 54 33.93	22 39 11.6	5.1	5.0	0.36
20	23 13.0	13 9 54.01	5 56 57.5	5.2	5.1	0.34	6	0 1.6	16 59 58.59	22 49 42.2	5.1	5.0	0.36
21	23 13.7	13 14 32.35	- 6 26 15.0	5.2	5.1	0.34	7	0 3.1	17 5 24.06	-22 59 31.6	5.1	5.0	0.36
22	23 14.4	13 19 11.28	6 55 24.8	5.2	5.1	0.34	8	0 4.5	17 10 50.28	23 8 39.4	5.2	5.0	0.36
23	23 15.1	13 23 50.83	7 24 26.0	5.2	5.1	0.34	9	0 6.0	17 16 17.20	23 17 5.1	5.2	5.0	0.36
24	23 15.8	13 28 31.04	7 53 17.9	5.2	5.1	0.34	10	0 7.5	17 21 44.77	23 24 48.1	5.2	5.0	0.36
25	23 16.5	13 33 11.96	8 21 59.8	5.2	5.1	0.34	11	0 9.1	17 27 12.93	23 31 48.2	5.2	5.0	0.37
26	23 17.3	13 37 53.60	- 8 50 30.9	5.2	5.1	0.34	12	0 10.6	17 32 41.63	-23 38 5.0	5.2	5.0	0.37
27	23 18.1	13 42 36.00	9 18 50.3	5.2	5.0	0.34	13	0 12.1	17 38 10.81	23 43 38.4	5.2	5.0	0.37
28	23 18.8	13 47 19.21	9 46 57.2	5.2	5.0	0.34	14	0 13.7	17 43 40.42	23 48 27.9	5.2	5.0	0.37
29	23 19.6	13 52 3.25	10 14 50.8	5.2	5.0	0.34	15	0 15.2	17 49 10.39	23 52 33.3	5.2	5.0	0.37
30	23 20.4	13 56 48.16	10 42 30.3	5.2	5.0	0.34	16	0 16.8	17 54 40.67	23 55 54.5	5.2	5.0	0.37
31	23 21.2	14 1 33.96	-11 9 54.9	5.2	5.0	0.34	17	0 18.4	18 0 11.20	-23 58 31.1	5.2	5.0	0.37
Nov. 1	23 22.1	14 6 20.68	11 37 3.9	5.2	5.0	0.34	18	0 19.9	18 5 41.90	24 0 23.1	5.2	5.0	0.37
2	23 22.9	14 11 8.35	12 3 56.3	5.2	5.0	0.34	19	0 21.5	18 11 12.72	24 1 30.5	5.2	5.0	0.37
3	23 23.8	14 15 57.00	12 30 31.4	5.2	5.0	0.34	20	0 23.1	18 16 43.60	24 1 53.0	5.2	5.0	0.37
4	23 24.7	14 20 46.67	12 56 48.2	5.2	5.0	0.34	21	0 24.6	18 22 14.47	24 1 30.6	5.2	5.0	0.37
5	23 25.6	14 25 37.38	-13 22 46.1	5.2	5.0	0.34	22	0 26.2	18 27 45.27	-24 0 23.5	5.2	5.0	0.37
6	23 26.5	14 30 29.15	13 48 24.3	5.2	5.0	0.34	23	0 27.8	18 33 15.93	23 58 31.5	5.2	5.0	0.37
7	23 27.4	14 35 22.01	14 13 41.8	5.2	5.0	0.35	24	0 29.3	18 38 46.39	23 55 54.7	5.2	5.0	0.37
8	23 28.4	14 40 15.98	14 38 37.9	5.2	5.0	0.35	25	0 30.9	18 44 16.58	23 52 33.2	5.2	5.0	0.37
9	23 29.4	14 45 11.07	15 3 11.9	5.2	5.0	0.35	26	0 32.4	18 49 46.45	23 48 27.2	5.2	5.0	0.37
10	23 30.4	14 50 7.29	-15 27 22.8	5.2	5.0	0.35	27	0 34.0	18 55 15.92	-23 43 36.8	5.2	5.0	0.37
11	23 31.4	14 55 4.67	15 51 9.8	5.2	5.0	0.35	28	0 35.5	19 0 44.92	23 38 2.2	5.2	5.0	0.37
12	23 32.4	15 0 3.23	16 14 32.2	5.2	5.0	0.35	29	0 37.0	19 6 13.40	23 31 43.7	5.2	5.0	0.37
13	23 33.4	15 5 2.97	16 37 29.1	5.1	5.0	0.35	30	0 38.5	19 11 41.29	23 24 41.5	5.2	5.0	0.37
14	23 34.5	15 10 3.92	16 59 59.8	5.1	5.0	0.35	31	0 40.0	19 17 8.53	23 16 55.9	5.2	5.0	0.37
15	23 35.6	15 15 6.08	-17 22 3.6	5.1	5.0	0.35	32	0 41.5	19 22 35.07	-23 8 27.3	5.2	5.0	0.37
16	23 36.7	15 20 9.46	-17 43 39.7	5.1	5.0	0.35	33	0 43.0	19 28 0.85	-22 59 16.1	5.2	5.1	0.37

## FOR TRANSIT AT WASHINGTON.

Date	Mean Time of Transit	Apparent Right Ascension	Apparent Declination	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.	Date	Mean Time of Transit	Apparent Right Ascension	Apparent Declination	Hor. Par.	Semi-diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	18 10.1	12 51 2.58	-4 3 11.1	1.6	17.3	1.23	Feb. 15	15 12.3	12 54 6.09	-4 9 37.8	1.9	19.8	1.41
1	18 6.5	12 51 21.47	4 4 54.2	1.6	17.4	1.24	16	15 8.2	12 53 53.97	4 8 6.6	1.9	19.8	1.42
2	18 2.9	12 51 39.75	4 6 33.4	1.6	17.4	1.24	17	15 4.1	12 53 41.21	4 6 31.5	1.9	19.9	1.42
3	17 59.3	12 51 57.43	4 8 8.6	1.6	17.5	1.24	18	14 59.9	12 53 27.81	4 4 52.5	1.9	19.9	1.43
4	17 55.6	12 52 14.50	4 9 39.8	1.6	17.5	1.25	19	14 55.8	12 53 13.78	4 3 9.8	1.9	20.0	1.43
5	17 51.9	12 52 30.95	-4 11 7.1	1.6	17.6	1.25	20	14 51.6	12 52 59.13	-4 1 23.3	1.9	20.0	1.43
6	17 48.3	12 52 46.78	4 12 30.3	1.6	17.6	1.25	21	14 47.4	12 52 43.87	3 59 33.1	1.9	20.1	1.44
7	17 44.6	12 53 1.97	4 13 49.3	1.7	17.7	1.26	22	14 43.2	12 52 28.00	3 57 39.3	1.9	20.1	1.44
8	17 40.9	12 53 16.53	4 15 4.1	1.7	17.8	1.26	23	14 39.0	12 52 11.53	3 55 42.0	1.9	20.2	1.44
9	17 37.2	12 53 30.45	4 16 14.7	1.7	17.8	1.26	24	14 34.8	12 51 54.47	3 53 41.2	1.9	20.2	1.44
10	17 33.5	12 53 43.72	-4 17 21.1	1.7	17.9	1.27	25	14 30.6	12 51 36.83	-3 51 37.0	1.9	20.3	1.45
11	17 29.8	12 53 56.34	4 18 23.4	1.7	17.9	1.27	26	14 26.3	12 51 18.64	3 49 29.3	1.9	20.3	1.45
12	17 26.1	12 54 8.30	4 19 21.5	1.7	18.0	1.28	27	14 22.1	12 50 59.89	3 47 18.4	1.9	20.4	1.45
13	17 22.3	12 54 19.59	4 20 15.5	1.7	18.0	1.28	28	14 17.9	12 50 40.59	3 45 4.4	1.9	20.4	1.45
14	17 18.6	12 54 30.22	4 21 5.2	1.7	18.1	1.28	Mar. 1	14 13.6	12 50 20.75	3 42 47.3	1.9	20.4	1.45
15	17 14.8	12 54 40.18	-4 21 50.7	1.7	18.1	1.29	2	14 9.3	12 50 0.39	-3 40 27.1	1.9	20.5	1.46
16	17 11.0	12 54 49.46	4 22 31.9	1.7	18.2	1.29	3	14 5.0	12 49 39.51	3 38 3.9	1.9	20.5	1.46
17	17 7.2	12 54 58.07	4 23 8.8	1.7	18.2	1.30	4	14 0.7	12 49 18.14	3 35 37.9	1.9	20.6	1.46
18	17 3.4	12 55 6.00	4 23 41.3	1.7	18.3	1.30	5	13 56.4	12 48 56.28	3 33 9.0	1.9	20.6	1.46
19	16 59.6	12 55 13.25	4 24 9.5	1.7	18.4	1.30	6	13 52.1	12 48 33.96	3 30 37.4	1.9	20.6	1.47
20	16 55.8	12 55 19.82	-4 24 33.4	1.7	18.4	1.31	7	13 47.8	12 48 11.18	-3 28 3.2	1.9	20.7	1.47
21	16 51.9	12 55 25.70	4 24 53.1	1.7	18.5	1.31	8	13 43.5	12 47 47.95	3 25 26.5	1.9	20.7	1.47
22	16 48.1	12 55 30.89	4 25 8.5	1.7	18.5	1.32	9	13 39.2	12 47 24.30	3 22 47.4	1.9	20.7	1.47
23	16 44.3	12 55 35.39	4 25 19.5	1.7	18.6	1.32	10	13 34.8	12 47 0.24	3 20 6.0	1.9	20.8	1.48
24	16 40.4	12 55 39.20	4 25 26.1	1.7	18.7	1.33	11	13 30.5	12 46 35.79	3 17 22.3	1.9	20.8	1.48
25	16 36.5	12 55 42.32	-4 25 28.3	1.7	18.7	1.33	12	13 26.2	12 46 10.96	-3 14 36.6	2.0	20.8	1.48
26	16 32.6	12 55 44.74	4 25 26.2	1.7	18.8	1.34	13	13 21.8	12 45 45.78	3 11 49.0	2.0	20.8	1.48
27	16 28.7	12 55 46.46	4 25 19.8	1.8	18.8	1.34	14	13 17.4	12 45 20.26	3 8 59.6	2.0	20.9	1.49
28	16 24.8	12 55 47.48	4 25 9.1	1.8	18.9	1.35	15	13 13.1	12 44 54.43	3 6 8.4	2.0	20.9	1.49
29	16 20.8	12 55 47.80	4 24 54.0	1.8	18.9	1.35	16	13 8.8	12 44 28.30	3 3 15.7	2.0	20.9	1.49
30	16 16.9	12 55 47.41	-4 24 34.5	1.8	19.0	1.35	17	13 4.4	12 44 1.89	-3 0 21.5	2.0	20.9	1.49
31	16 13.0	12 55 46.31	4 24 10.6	1.8	19.0	1.36	18	13 0.0	12 43 35.20	2 57 25.9	2.0	21.0	1.49
Feb. 1	16 9.0	12 55 44.51	4 23 42.4	1.8	19.1	1.36	19	12 55.6	12 43 8.28	2 54 29.1	2.0	21.0	1.49
2	16 5.0	12 55 42.01	4 23 9.9	1.8	19.1	1.36	20	12 51.2	12 42 41.13	2 51 31.3	2.0	21.0	1.50
3	16 1.0	12 55 38.81	4 22 33.0	1.8	19.2	1.37	21	12 46.8	12 42 13.78	2 48 32.5	2.0	21.0	1.50
4	15 57.0	12 55 34.90	-4 21 51.8	1.8	19.2	1.37	22	12 42.4	12 41 46.24	-2 45 32.8	2.0	21.1	1.50
5	15 53.0	12 55 30.29	4 21 6.2	1.8	19.3	1.38	23	12 38.0	12 41 18.54	2 42 32.4	2.0	21.1	1.50
6	15 49.0	12 55 24.97	4 20 16.3	1.8	19.3	1.38	24	12 33.6	12 40 50.68	2 39 31.4	2.0	21.1	1.50
7	15 44.9	12 55 18.95	4 19 22.0	1.8	19.4	1.38	25	12 29.2	12 40 22.70	2 36 30.0	2.0	21.1	1.50
8	15 40.8	12 55 12.23	4 18 23.5	1.8	19.4	1.39	26	12 24.8	12 39 54.61	2 33 28.2	2.0	21.1	1.50
9	15 36.8	12 55 4.82	-4 17 20.8	1.8	19.5	1.39	27	12 20.4	12 39 26.41	-2 30 26.2	2.0	21.1	1.50
10	15 32.8	12 54 56.72	4 16 13.9	1.8	19.5	1.40	28	12 16.0	12 38 58.14	2 27 24.2	2.0	21.1	1.50
11	15 28.7	12 54 47.94	4 15 2.9	1.8	19.6	1.40	29	12 11.6	12 38 29.82	2 24 22.1	2.0	21.1	1.50
12	15 24.6	12 54 38.48	4 13 47.7	1.8	19.6	1.40	30	12 7.2	12 38 1.46	2 21 20.0	2.0	21.1	1.50
13	15 20.5	12 54 28.35	4 12 28.4	1.8	19.7	1.41	31	12 2.8	12 37 33.09	2 18 18.2	2.0	21.1	1.50
14	15 16.4	12 54 17.55	-4 11 5.1	1.8	19.7	1.41	Apr. 1	11 58.4	12 37 4.72	-2 15 16.8	2.0	21.1	1.50
15	15 12.3	12 54 6.09	-4 9 37.8	1.9	19.8	1.41	2	11 54.0	12 36 36.38	-2 12 15.9	2.0	21.1	1.50

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	11 58.4	12 37 4.72	-2 15 16.8	2.0	21.1	1.50	May 16	8 45.2	12 20 41.35	-0 36 23.1	1.9	19.8	1.41
2	11 54.0	12 36 36.38	2 12 15.9	2.0	21.1	1.50	17	8 41.1	12 20 30.96	0 35 31.1	1.9	19.7	1.40
3	11 49.6	12 36 8.08	2 9 15.7	2.0	21.1	1.50	18	8 37.0	12 20 21.21	0 34 43.4	1.9	19.7	1.40
4	11 45.2	12 35 39.84	2 6 16.2	2.0	21.1	1.50	19	8 32.9	12 20 12.10	0 33 59.9	1.8	19.6	1.40
5	11 40.8	12 35 11.67	2 3 17.6	2.0	21.1	1.50	20	8 28.8	12 20 3.63	0 33 20.7	1.8	19.6	1.39
6	11 36.4	12 34 43.61	-2 0 20.0	2.0	21.1	1.50	21	8 24.7	12 19 55.81	-0 32 45.8	1.8	19.5	1.39
7	11 32.0	12 34 15.69	1 57 23.5	2.0	21.1	1.50	22	8 20.7	12 19 48.64	0 32 15.2	1.8	19.5	1.39
8	11 27.6	12 33 47.89	1 54 28.4	2.0	21.1	1.50	23	8 16.6	12 19 42.12	0 31 48.9	1.8	19.4	1.38
9	11 23.2	12 33 20.27	1 51 34.7	2.0	21.1	1.50	24	8 12.6	12 19 36.24	0 31 27.0	1.8	19.4	1.38
10	11 18.8	12 32 52.83	1 48 42.5	2.0	21.1	1.50	25	8 8.6	12 19 31.02	0 31 9.4	1.8	19.3	1.37
11	11 14.4	12 32 25.60	-1 45 51.9	2.0	21.1	1.50	26	8 4.6	12 19 26.45	-0 30 56.0	1.8	19.3	1.37
12	11 10.1	12 31 58.59	1 43 3.2	2.0	21.1	1.49	27	8 0.6	12 19 22.53	0 30 47.0	1.8	19.2	1.37
13	11 5.7	12 31 31.83	1 40 16.5	2.0	21.0	1.49	28	7 56.6	12 19 19.27	0 30 42.4	1.8	19.2	1.36
14	11 1.3	12 31 5.33	1 37 31.8	2.0	21.0	1.49	29	7 52.6	12 19 16.67	0 30 42.1	1.8	19.1	1.36
15	10 56.9	12 30 39.11	1 34 49.2	2.0	21.0	1.49	30	7 48.6	12 19 14.73	0 30 46.1	1.8	19.1	1.36
16	10 52.6	12 30 13.20	-1 32 8.9	2.0	21.0	1.49	31	7 44.6	12 19 13.45	-0 30 54.3	1.8	19.0	1.35
17	10 48.2	12 29 47.60	1 29 31.0	2.0	21.0	1.49	June 1	7 40.7	12 19 12.83	0 31 6.8	1.8	19.0	1.35
18	10 43.8	12 29 22.33	1 26 55.5	2.0	20.9	1.49	2	7 36.8	12 19 12.86	0 31 23.7	1.8	18.9	1.34
19	10 39.5	12 28 57.39	1 24 22.5	2.0	20.9	1.49	3	7 32.9	12 19 13.54	0 31 44.9	1.8	18.9	1.34
20	10 35.2	12 28 32.80	1 21 52.1	2.0	20.9	1.49	4	7 29.0	12 19 14.88	0 32 10.4	1.8	18.8	1.34
21	10 30.8	12 28 8.59	-1 19 24.5	1.9	20.9	1.48	5	7 25.1	12 19 16.88	-0 32 40.1	1.8	18.8	1.34
22	10 26.5	12 27 44.77	1 16 59.7	1.9	20.8	1.48	6	7 21.2	12 19 19.55	0 33 14.1	1.8	18.7	1.33
23	10 22.2	12 27 21.35	1 14 37.8	1.9	20.8	1.48	7	7 17.3	12 19 22.88	0 33 52.3	1.8	18.7	1.33
24	10 17.9	12 26 58.34	1 12 19.0	1.9	20.8	1.48	8	7 13.4	12 19 26.86	0 34 34.8	1.7	18.6	1.33
25	10 13.6	12 26 35.77	1 10 3.3	1.9	20.7	1.48	9	7 9.5	12 19 31.48	0 35 21.5	1.7	18.6	1.32
26	10 9.3	12 26 13.64	-1 7 50.7	1.9	20.7	1.47	10	7 5.7	12 19 36.75	-0 36 12.5	1.7	18.5	1.32
27	10 5.0	12 25 51.96	1 5 41.3	1.9	20.7	1.47	11	7 1.9	12 19 42.66	0 37 7.7	1.7	18.5	1.31
28	10 0.7	12 25 30.74	1 3 35.2	1.9	20.6	1.47	12	6 58.1	12 19 49.22	0 38 7.0	1.7	18.4	1.31
29	9 56.4	12 25 10.00	1 1 32.4	1.9	20.6	1.47	13	6 54.3	12 19 56.42	0 39 10.4	1.7	18.4	1.30
30	9 52.1	12 24 49.76	0 59 33.0	1.9	20.6	1.46	14	6 50.5	12 20 4.26	0 40 17.9	1.7	18.3	1.30
May 1	9 47.9	12 24 30.02	-0 57 37.1	1.9	20.5	1.46	15	6 46.7	12 20 12.73	-0 41 29.4	1.7	18.2	1.30
2	9 43.7	12 24 10.80	0 55 44.9	1.9	20.5	1.46	16	6 42.9	12 20 21.82	0 42 44.9	1.7	18.2	1.29
3	9 39.4	12 23 52.11	0 53 56.4	1.9	20.4	1.46	17	6 39.1	12 20 31.53	0 44 4.4	1.7	18.1	1.29
4	9 35.2	12 23 33.95	0 52 11.6	1.9	20.4	1.46	18	6 35.3	12 20 41.85	0 45 28.0	1.7	18.1	1.29
5	9 31.0	12 23 16.34	0 50 30.6	1.9	20.3	1.45	19	6 31.6	12 20 52.79	0 46 55.4	1.7	18.0	1.28
6	9 26.8	12 22 59.28	-0 48 53.4	1.9	20.3	1.45	20	6 27.8	12 21 4.34	-0 48 26.6	1.7	18.0	1.28
7	9 22.6	12 22 42.79	0 47 20.0	1.9	20.2	1.44	21	6 24.1	12 21 16.50	0 50 1.7	1.7	17.9	1.27
8	9 18.4	12 22 26.88	0 45 50.6	1.9	20.2	1.44	22	6 20.4	12 21 29.25	0 51 40.7	1.7	17.9	1.27
9	9 14.2	12 22 11.57	0 44 25.1	1.9	20.1	1.43	23	6 16.7	12 21 42.60	0 53 23.4	1.7	17.8	1.27
10	9 10.0	12 21 56.84	0 43 3.7	1.9	20.1	1.43	24	6 13.0	12 21 56.54	0 55 9.9	1.7	17.8	1.26
11	9 5.8	12 21 42.71	-0 41 46.5	1.9	20.0	1.43	25	6 9.3	12 22 11.07	-0 57 0.0	1.7	17.7	1.26
12	9 1.6	12 21 29.19	0 40 33.4	1.9	20.0	1.42	26	6 5.6	12 22 26.18	0 58 53.8	1.7	17.7	1.26
13	8 57.5	12 21 16.28	0 39 24.5	1.9	19.9	1.42	27	6 2.0	12 22 41.87	1 0 51.2	1.7	17.6	1.25
14	8 53.4	12 21 4.01	0 38 19.8	1.9	19.9	1.42	28	5 58.3	12 22 58.13	1 2 52.2	1.6	17.6	1.25
15	8 49.3	12 20 52.37	0 37 19.3	1.9	19.8	1.41	29	5 54.6	12 23 14.96	1 4 56.8	1.6	17.5	1.25
16	8 45.2	12 20 41.35	-0 36 23.1	1.9	19.8	1.41	30	5 51.0	12 23 32.36	-1 7 5.1	1.6	17.5	1.24
17	8 41.1	12 20 30.96	-0 35 31.1	1.9	19.7	1.40	July 1	5 47.4	12 23 50.32	-1 9 17.1	1.6	17.4	1.24

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi-diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	6 25.8	1 44.86	+ 4 8 59.0	1.0	8.5	0.61	Aug. 16	16 40.8	2 20 25.82	+11 17 46.0	1.0	8.7	0.63
1	6 21.9	1 44.95	4 9 46.2	1.0	8.5	0.61	17	16 36.9	2 20 26.82	11 17 34.8	1.0	8.8	0.63
2	6 18.1	1 45.46	4 10 35.7	1.0	8.5	0.61	18	16 33.0	2 20 27.41	11 17 21.6	1.0	8.8	0.64
3	6 14.2	1 5 0.14	4 11 27.6	1.0	8.5	0.61	19	16 29.0	2 20 27.60	11 17 6.4	1.0	8.8	0.64
4	6 10.4	1 5 6.03	4 12 21.9	1.0	8.5	0.61	20	16 25.1	2 20 27.38	11 16 49.3	1.0	8.8	0.64
5	6 6.6	1 5 12.31	+ 4 13 18.7	1.0	8.5	0.61	21	16 21.2	2 20 26.76	+11 16 30.2	1.0	8.8	0.64
6	6 2.7	1 5 18.99	4 14 17.9	1.0	8.4	0.61	22	16 17.2	2 20 25.73	11 16 9.1	1.0	8.9	0.64
7	5 58.9	1 5 26.07	4 15 19.5	1.0	8.4	0.60	23	16 13.3	2 20 24.30	11 15 46.0	1.0	8.9	0.64
8	5 55.1	1 5 33.55	4 16 23.4	1.0	8.4	0.60	24	16 9.3	2 20 22.47	11 15 20.9	1.0	8.9	0.64
9	5 51.3	1 5 41.42	4 17 29.6	1.0	8.4	0.60	25	16 5.3	2 20 20.23	11 14 53.8	1.0	8.9	0.64
10	5 47.5	1 5 49.68	+ 4 18 38.3	1.0	8.4	0.60	26	16 1.4	2 20 17.59	+11 14 24.8	1.0	8.9	0.65
11	5 43.7	1 5 58.33	4 19 49.2	1.0	8.4	0.60	27	15 57.4	2 20 14.55	11 13 53.8	1.0	8.9	0.65
12	5 39.9	1 6 7.36	4 21 2.3	1.0	8.4	0.60	28	15 53.4	2 20 11.11	11 13 20.9	1.0	8.9	0.65
13	5 36.1	1 6 16.78	4 22 17.7	1.0	8.4	0.60	29	15 49.4	2 20 7.26	11 12 46.1	1.0	9.0	0.65
14	5 32.4	1 6 26.58	+ 4 23 35.4	1.0	8.3	0.60	30	15 45.4	2 20 3.00	11 12 9.3	1.0	9.0	0.65
July 16	18 39.0	2 16 39.91	+11 6 48.0	0.9	8.3	0.60	31	15 41.4	2 19 58.34	+11 11 30.6	1.0	9.0	0.65
17	18 35.3	2 16 52.79	11 7 39.0	0.9	8.3	0.60	Sept. 1	15 37.4	2 19 53.30	11 10 50.0	1.0	9.0	0.65
18	18 31.5	2 17 5.31	11 8 28.1	0.9	8.3	0.60	2	15 33.4	2 19 47.87	11 10 7.5	1.0	9.0	0.65
19	18 27.8	2 17 17.48	11 9 15.3	0.9	8.4	0.61	3	15 29.3	2 19 42.03	11 9 23.1	1.0	9.0	0.65
20	18 24.1	2 17 29.31	11 10 0.5	0.9	8.4	0.61	4	15 25.3	2 19 35.81	11 8 36.9	1.0	9.0	0.66
21	18 20.3	2 17 40.78	+11 10 43.8	0.9	8.4	0.61	5	15 21.2	2 19 29.22	+11 7 48.9	1.0	9.0	0.66
22	18 16.6	2 17 51.89	11 11 25.1	0.9	8.4	0.61	6	15 17.2	2 19 22.25	11 6 59.0	1.0	9.1	0.66
23	18 12.8	2 18 2.64	11 12 4.5	0.9	8.4	0.61	7	15 13.1	2 19 14.89	11 6 7.3	1.0	9.1	0.66
24	18 9.1	2 18 13.02	11 12 41.9	0.9	8.4	0.61	8	15 9.1	2 19 7.15	11 5 13.9	1.0	9.1	0.66
25	18 5.3	2 18 23.04	11 13 17.4	0.9	8.4	0.62	9	15 5.0	2 18 59.04	11 4 18.8	1.0	9.1	0.66
26	18 1.5	2 18 32.69	+11 13 50.9	0.9	8.5	0.62	10	15 1.0	2 18 50.56	+11 3 22.0	1.0	9.1	0.66
27	17 57.8	2 18 41.97	11 14 22.4	0.9	8.5	0.62	11	14 56.9	2 18 41.71	11 2 23.5	1.0	9.1	0.66
28	17 54.0	2 18 50.88	11 14 51.9	0.9	8.5	0.62	12	14 52.8	2 18 32.51	11 1 23.3	1.0	9.1	0.67
29	17 50.2	2 18 59.41	11 15 19.4	0.9	8.5	0.62	13	14 48.7	2 18 22.95	11 0 21.6	1.0	9.1	0.67
30	17 46.4	2 19 7.56	11 15 44.9	0.9	8.5	0.62	14	14 44.6	2 18 13.04	10 59 18.2	1.0	9.2	0.67
31	17 42.6	2 19 15.32	+11 16 8.3	1.0	8.5	0.62	15	14 40.5	2 18 2.79	+10 58 13.2	1.0	9.2	0.67
Aug. 1	17 38.8	2 19 22.70	11 16 29.7	1.0	8.5	0.62	16	14 36.4	2 17 52.20	10 57 6.7	1.0	9.2	0.67
2	17 35.0	2 19 29.69	11 16 49.2	1.0	8.6	0.62	17	14 32.3	2 17 41.27	10 55 58.7	1.0	9.2	0.67
3	17 31.1	2 19 36.28	11 17 6.6	1.0	8.6	0.62	18	14 28.2	2 17 30.00	10 54 49.2	1.0	9.2	0.67
4	17 27.3	2 19 42.48	11 17 21.9	1.0	8.6	0.62	19	14 24.0	2 17 18.40	10 53 38.2	1.0	9.2	0.67
5	17 23.5	2 19 48.29	+11 17 35.1	1.0	8.6	0.63	20	14 19.9	2 17 6.49	+10 52 25.7	1.0	9.2	0.67
6	17 19.6	2 19 53.70	11 17 46.3	1.0	8.6	0.63	21	14 15.8	2 16 54.27	10 51 11.9	1.0	9.2	0.67
7	17 15.8	2 19 58.72	11 17 55.4	1.0	8.6	0.63	22	14 11.6	2 16 41.74	10 49 56.7	1.0	9.2	0.67
8	17 11.9	2 20 3.34	11 18 2.5	1.0	8.6	0.63	23	14 7.5	2 16 28.90	10 48 40.1	1.0	9.2	0.67
9	17 8.1	2 20 7.56	11 18 7.7	1.0	8.6	0.63	24	14 3.3	2 16 15.75	10 47 22.2	1.0	9.2	0.67
10	17 4.2	2 20 11.37	+11 18 10.7	1.0	8.6	0.63	25	13 59.2	2 16 2.31	+10 46 3.0	1.0	9.2	0.67
11	17 0.3	2 20 14.78	11 18 11.6	1.0	8.7	0.63	26	13 55.0	2 15 48.58	10 44 42.6	1.0	9.2	0.67
12	16 56.4	2 20 17.79	11 18 10.5	1.0	8.7	0.63	27	13 50.8	2 15 34.58	10 43 20.9	1.0	9.2	0.67
13	16 52.5	2 20 20.41	11 18 7.4	1.0	8.7	0.63	28	13 46.7	2 15 20.31	10 41 58.1	1.0	9.2	0.68
14	16 48.6	2 20 22.62	11 18 2.3	1.0	8.7	0.63	29	13 42.5	2 15 5.78	10 40 34.2	1.0	9.2	0.68
15	16 44.7	2 20 24.42	+11 17 55.2	1.0	8.7	0.63	30	13 38.3	2 14 50.98	+10 39 9.2	1.0	9.2	0.68
16	16 40.8	2 20 25.82	+11 17 46.0	1.0	8.7	0.63	Oct. 1	13 34.2	2 14 35.93	+10 37 43.1	1.0	9.3	0.68

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Oct. 1	13 34.2	2 14 35.93	+10 37 43.1	1.0	9.3	0.68	Nov. 16	10 19.9	2 1 11.59	+9 27 5.5	1.1	9.4	0.68
2	13 30.0	2 14 20.64	10 36 16.0	1.1	9.3	0.68	17	10 15.7	2 0 55.36	9 25 47.1	1.1	9.4	0.68
3	13 25.8	2 14 5.12	10 34 47.9	1.1	9.3	0.68	18	10 11.5	2 0 39.33	9 24 30.0	1.1	9.4	0.68
4	13 21.6	2 13 49.37	10 33 18.8	1.1	9.3	0.68	19	10 7.3	2 0 23.53	9 23 14.4	1.1	9.4	0.68
5	13 17.4	2 13 33.39	10 31 49.0	1.1	9.4	0.68	20	10 3.1	2 0 7.95	9 22 0.3	1.1	9.4	0.68
6	13 13.2	2 13 17.21	+10 30 18.4	1.1	9.4	0.68	21	9 59.0	1 59 52.60	+9 20 47.7	1.1	9.4	0.68
7	13 9.0	2 13 0.83	10 28 47.0	1.1	9.4	0.68	22	9 54.8	1 59 37.49	9 19 36.7	1.1	9.4	0.68
8	13 4.8	2 12 44.26	10 27 14.8	1.1	9.4	0.68	23	9 50.6	1 59 22.63	9 18 27.3	1.1	9.3	0.67
9	13 0.6	2 12 27.50	10 25 41.9	1.1	9.4	0.68	24	9 46.5	1 59 8.02	9 17 19.6	1.1	9.3	0.67
10	12 56.4	2 12 10.58	10 24 8.4	1.1	9.4	0.68	25	9 42.3	1 58 53.67	9 16 13.6	1.1	9.3	0.67
11	12 52.2	2 11 53.50	+10 22 34.4	1.1	9.4	0.68	26	9 38.1	1 58 39.60	+9 15 9.3	1.1	9.3	0.67
12	12 48.0	2 11 36.27	10 20 59.9	1.1	9.4	0.68	27	9 33.9	1 58 25.81	9 14 6.8	1.1	9.3	0.67
13	12 43.8	2 11 18.89	10 19 24.9	1.1	9.4	0.68	28	9 29.8	1 58 12.31	9 13 6.0	1.0	9.3	0.67
14	12 39.6	2 11 1.38	10 17 49.5	1.1	9.4	0.69	29	9 25.6	1 57 59.10	9 12 7.0	1.0	9.3	0.67
15	12 35.3	2 10 43.74	10 16 13.8	1.1	9.4	0.69	30	9 21.4	1 57 46.19	9 11 10.0	1.0	9.3	0.67
16	12 31.1	2 10 25.98	+10 14 37.7	1.1	9.5	0.69	Dec. 1	9 17.3	1 57 33.60	+9 10 15.0	1.0	9.2	0.67
17	12 26.9	2 10 8.11	10 13 1.3	1.1	9.5	0.69	2	9 13.2	1 57 21.33	9 9 21.9	1.0	9.2	0.67
18	12 22.6	2 9 50.15	10 11 24.7	1.1	9.5	0.69	3	9 9.1	1 57 9.38	9 8 30.7	1.0	9.2	0.67
19	12 18.4	2 9 32.10	10 9 47.9	1.1	9.5	0.69	4	9 5.0	1 56 57.76	9 7 41.6	1.0	9.2	0.67
20	12 14.1	2 9 13.97	10 8 11.0	1.1	9.5	0.69	5	9 0.8	1 56 46.48	9 6 54.6	1.0	9.2	0.67
21	12 9.9	2 8 55.77	+10 6 34.0	1.1	9.5	0.69	6	8 56.7	1 56 35.54	+9 6 9.6	1.0	9.2	0.67
22	12 5.7	2 8 37.51	10 4 57.0	1.1	9.5	0.69	7	8 52.6	1 56 24.95	9 5 26.8	1.0	9.2	0.67
23	12 1.4	2 8 19.20	10 3 20.0	1.1	9.5	0.69	8	8 48.5	1 56 14.71	9 4 46.1	1.0	9.2	0.66
24	11 57.2	2 8 0.84	10 1 43.1	1.1	9.5	0.69	9	8 44.4	1 56 4.83	9 4 7.6	1.0	9.2	0.66
25	11 53.0	2 7 42.45	10 0 6.3	1.1	9.5	0.69	10	8 40.3	1 55 55.31	9 3 31.3	1.0	9.1	0.66
26	11 48.7	2 7 24.06	+9 58 29.8	1.1	9.5	0.69	11	8 36.2	1 55 46.16	+9 2 57.2	1.0	9.1	0.66
27	11 44.5	2 7 5.65	9 56 53.5	1.1	9.5	0.69	12	8 32.1	1 55 37.38	9 2 25.3	1.0	9.1	0.66
28	11 40.2	2 6 47.23	9 55 17.4	1.1	9.5	0.69	13	8 28.1	1 55 28.98	9 1 55.6	1.0	9.1	0.66
29	11 36.0	2 6 28.82	9 53 41.7	1.1	9.5	0.69	14	8 24.0	1 55 20.95	9 1 28.2	1.0	9.1	0.66
30	11 31.8	2 6 10.44	9 52 6.4	1.1	9.5	0.69	15	8 19.9	1 55 13.30	9 1 3.0	1.0	9.1	0.66
31	11 27.5	2 5 52.10	+9 50 31.6	1.1	9.5	0.69	16	8 15.9	1 55 6.03	+9 0 40.1	1.0	9.1	0.65
Nov. 1	11 23.3	2 5 33.81	9 48 57.4	1.1	9.5	0.69	17	8 11.9	1 54 59.16	9 0 19.4	1.0	9.1	0.65
2	11 19.0	2 5 15.57	9 47 23.8	1.1	9.5	0.69	18	8 7.8	1 54 52.69	9 0 1.1	1.0	9.0	0.65
3	11 14.8	2 4 57.40	9 45 50.8	1.1	9.5	0.69	19	8 3.8	1 54 46.61	8 59 45.1	1.0	9.0	0.65
4	11 10.6	2 4 39.30	9 44 18.5	1.1	9.5	0.69	20	7 59.8	1 54 40.91	8 59 31.5	1.0	9.0	0.65
5	11 6.4	2 4 21.28	+9 42 46.9	1.1	9.5	0.69	21	7 55.7	1 54 35.62	+8 59 20.3	1.0	9.0	0.65
6	11 2.1	2 4 3.35	9 41 16.1	1.1	9.5	0.69	22	7 51.7	1 54 30.74	8 59 11.3	1.0	9.0	0.65
7	10 57.9	2 3 45.53	9 39 46.2	1.1	9.4	0.68	23	7 47.7	1 54 26.27	8 59 4.6	1.0	9.0	0.65
8	10 53.7	2 3 27.83	9 38 17.3	1.1	9.4	0.68	24	7 43.7	1 54 22.21	8 59 0.2	1.0	9.0	0.64
9	10 49.4	2 3 10.26	9 36 49.4	1.1	9.4	0.68	25	7 39.7	1 54 18.56	8 58 58.2	1.0	8.9	0.64
10	10 45.2	2 2 52.83	+9 35 22.6	1.1	9.4	0.68	26	7 35.8	1 54 15.32	+8 58 58.5	1.0	8.9	0.64
11	10 41.0	2 2 35.54	9 33 56.9	1.1	9.4	0.68	27	7 31.8	1 54 12.49	8 59 1.3	1.0	8.9	0.64
12	10 36.8	2 2 18.40	9 32 32.2	1.1	9.4	0.68	28	7 27.8	1 54 10.08	8 59 6.5	1.0	8.9	0.64
13	10 32.6	2 2 1.42	9 31 8.5	1.1	9.4	0.68	29	7 23.8	1 54 8.09	8 58 14.1	1.0	8.9	0.64
14	10 28.4	2 1 44.62	9 29 46.2	1.1	9.4	0.68	30	7 19.9	1 54 6.52	8 59 24.1	1.0	8.9	0.64
15	10 24.1	2 1 28.01	+9 28 25.2	1.1	9.4	0.68	31	7 15.9	1 54 5.37	+8 59 36.4	1.0	8.9	0.64
16	10 19.9	2 1 11.59	+9 27 5.5	1.1	9.4	0.68	32	7 12.0	1 54 4.65	+8 59 51.2	1.0	8.8	0.63

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 15	18 13.8	19 48 45.75	-21 35 30.8	0.4	1.7	0.12	June 1	15 7.6	19 47 18.28	-21 40 42.2	0.5	1.8	0.13
16	18 10.0	19 48 48.63	21 35 25.3	0.4	1.7	0.12	2	15 3.6	19 47 11.88	21 41 0.0	0.5	1.8	0.13
17	18 6.1	19 48 51.29	21 35 20.4	0.4	1.7	0.12	3	14 59.5	19 47 5.32	21 41 18.2	0.5	1.8	0.13
18	18 2.2	19 48 53.74	21 35 16.0	0.4	1.7	0.12	4	14 55.5	19 46 58.61	21 41 36.8	0.5	1.8	0.13
19	17 58.3	19 48 55.99	21 35 12.2	0.4	1.7	0.12	5	14 51.4	19 46 51.74	21 41 55.7	0.5	1.8	0.13
20	17 54.4	19 48 58.02	-21 35 8.9	0.5	1.7	0.12	6	14 47.4	19 46 44.72	-21 42 15.0	0.5	1.8	0.13
21	17 50.5	19 48 59.83	21 35 6.2	0.5	1.7	0.12	7	14 43.3	19 46 37.55	21 42 34.6	0.5	1.8	0.13
22	17 46.6	19 49 1.44	21 35 4.0	0.5	1.7	0.12	8	14 39.3	19 46 30.23	21 42 54.5	0.5	1.8	0.13
23	17 42.7	19 49 2.84	21 35 2.3	0.5	1.7	0.12	9	14 35.2	19 46 22.77	21 43 14.8	0.5	1.8	0.13
24	17 38.8	19 49 4.03	21 35 1.2	0.5	1.7	0.12	10	14 31.2	19 46 15.18	21 43 35.4	0.5	1.8	0.13
25	17 34.9	19 49 5.00	-21 35 0.7	0.5	1.7	0.12	11	14 27.1	19 46 7.45	-21 43 56.2	0.5	1.8	0.13
26	17 30.9	19 49 5.76	21 35 0.7	0.5	1.7	0.12	12	14 23.0	19 45 59.59	21 44 17.3	0.5	1.8	0.13
27	17 27.0	19 49 6.31	21 35 1.2	0.5	1.7	0.12	13	14 19.0	19 45 51.60	21 44 38.7	0.5	1.8	0.13
28	17 23.1	19 49 6.65	21 35 2.2	0.5	1.7	0.12	14	14 14.9	19 45 43.48	21 45 0.4	0.5	1.8	0.13
29	17 19.2	19 49 6.78	21 35 3.8	0.5	1.7	0.12	15	14 10.9	19 45 35.24	21 45 22.4	0.5	1.8	0.13
30	17 15.2	19 49 6.69	-21 35 6.0	0.5	1.7	0.12	16	14 6.8	19 45 26.88	-21 45 44.6	0.5	1.8	0.13
May 1	17 11.3	19 49 6.39	21 35 8.7	0.5	1.7	0.12	17	14 2.7	19 45 18.42	21 46 7.1	0.5	1.8	0.13
2	17 7.4	19 49 5.89	21 35 11.9	0.5	1.7	0.12	18	13 58.6	19 45 9.87	21 46 29.8	0.5	1.8	0.13
3	17 3.4	19 49 5.17	21 35 15.7	0.5	1.7	0.12	19	13 54.5	19 45 1.14	21 46 52.7	0.5	1.8	0.13
4	16 59.5	19 49 4.24	21 35 20.0	0.5	1.7	0.12	20	13 50.5	19 44 52.32	21 47 15.8	0.5	1.8	0.13
5	16 55.5	19 49 3.11	-21 35 24.9	0.5	1.7	0.12	21	13 46.4	19 44 43.42	-21 47 39.1	0.5	1.8	0.13
6	16 51.6	19 49 1.77	21 35 30.3	0.5	1.7	0.12	22	13 42.3	19 44 34.43	21 48 2.6	0.5	1.8	0.13
7	16 47.6	19 49 0.22	21 35 36.3	0.5	1.7	0.12	23	13 38.2	19 44 25.34	21 48 26.3	0.5	1.8	0.13
8	16 43.6	19 48 58.46	21 35 42.7	0.5	1.7	0.12	24	13 34.1	19 44 16.16	21 48 50.2	0.5	1.8	0.13
9	16 39.7	19 48 56.50	21 35 49.6	0.5	1.8	0.12	25	13 30.1	19 44 6.88	21 49 14.2	0.5	1.8	0.13
10	16 35.7	19 48 54.33	-21 35 57.1	0.5	1.8	0.13	26	13 26.0	19 43 57.52	-21 49 38.3	0.5	1.8	0.13
11	16 31.7	19 48 51.96	21 36 5.2	0.5	1.8	0.13	27	13 21.9	19 43 48.09	21 50 2.5	0.5	1.8	0.13
12	16 27.8	19 48 49.39	21 36 13.7	0.5	1.8	0.13	28	13 17.8	19 43 38.58	21 50 26.8	0.5	1.8	0.13
13	16 23.8	19 48 46.62	21 36 22.7	0.5	1.8	0.13	29	13 13.7	19 43 28.99	21 50 51.2	0.5	1.8	0.13
14	16 19.8	19 48 43.65	21 36 32.2	0.5	1.8	0.13	30	13 9.6	19 43 19.33	21 51 15.8	0.5	1.8	0.13
15	16 15.8	19 48 40.48	-21 36 42.2	0.5	1.8	0.13	July 1	13 5.5	19 43 9.60	-21 51 40.5	0.5	1.8	0.13
16	16 11.8	19 48 37.12	21 36 52.7	0.5	1.8	0.13	2	13 1.4	19 42 59.81	21 52 5.3	0.5	1.8	0.13
17	16 7.8	19 48 33.57	21 37 3.6	0.5	1.8	0.13	3	12 57.3	19 42 49.96	21 52 30.1	0.5	1.8	0.13
18	16 3.8	19 48 29.82	21 37 15.0	0.5	1.8	0.13	4	12 53.2	19 42 40.06	21 52 55.0	0.5	1.8	0.13
19	15 59.8	19 48 25.88	21 37 26.9	0.5	1.8	0.13	5	12 49.1	19 42 30.11	21 53 20.0	0.5	1.8	0.13
20	15 55.8	19 48 21.76	-21 37 39.3	0.5	1.8	0.13	6	12 45.0	19 42 20.12	-21 53 45.0	0.5	1.8	0.13
21	15 51.8	19 48 17.45	21 37 52.2	0.5	1.8	0.13	7	12 40.9	19 42 10.09	21 54 10.1	0.5	1.8	0.13
22	15 47.8	19 48 12.96	21 38 5.5	0.5	1.8	0.13	8	12 36.8	19 42 0.01	21 54 35.2	0.5	1.8	0.13
23	15 43.8	19 48 8.29	21 38 19.2	0.5	1.8	0.13	9	12 32.7	19 41 49.90	21 55 0.3	0.5	1.8	0.13
24	15 39.8	19 48 3.43	21 38 33.4	0.5	1.8	0.13	10	12 28.6	19 41 39.77	21 55 25.4	0.5	1.8	0.13
25	15 35.8	19 47 58.39	-21 38 48.2	0.5	1.8	0.13	11	12 24.5	19 41 29.62	-21 55 50.5	0.5	1.8	0.13
26	15 31.8	19 47 53.18	21 39 3.4	0.5	1.8	0.13	12	12 20.4	19 41 19.45	21 56 15.5	0.5	1.8	0.13
27	15 27.8	19 47 47.79	21 39 18.9	0.5	1.8	0.13	13	12 16.3	19 41 9.26	21 56 40.5	0.5	1.8	0.13
28	15 23.7	19 47 42.22	21 39 34.7	0.5	1.8	0.13	14	12 12.2	19 40 59.05	21 57 5.5	0.5	1.8	0.13
29	15 19.7	19 47 36.49	21 39 50.9	0.5	1.8	0.13	15	12 8.1	19 40 48.84	21 57 30.4	0.5	1.8	0.13
30	15 15.7	19 47 30.59	-21 40 7.6	0.5	1.8	0.13	16	12 4.0	19 40 38.63	-21 57 55.3	0.5	1.8	0.13
31	15 11.6	19 47 24.52	-21 40 24.7	0.5	1.8	0.13	17	11 59.9	19 40 28.43	-21 58 20.2	0.5	1.8	0.13

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
July 17	11 59.9	19 40 28.43	21 58 20.2	0.5	1.8	0.13	Sept. 1	8 52.4	19 33 48.85	22 13 31.0	0.5	1.8	0.13
18	11 55.8	19 40 18.23	21 58 44.9	0.5	1.8	0.13	2	8 48.4	19 33 43.05	22 13 43.1	0.5	1.8	0.13
19	11 51.7	19 40 8.04	21 59 9.5	0.5	1.8	0.13	3	8 44.4	19 33 37.43	22 13 54.9	0.5	1.8	0.13
20	11 47.6	19 39 57.86	21 59 34.0	0.5	1.8	0.13	4	8 40.3	19 33 31.99	22 14 6.0	0.5	1.8	0.13
21	11 43.5	19 39 47.69	21 59 58.5	0.5	1.8	0.13	5	8 36.3	19 33 26.73	22 14 16.9	0.5	1.8	0.13
22	11 39.4	19 39 37.55	22 0 22.8	0.5	1.8	0.13	6	8 32.3	19 33 21.65	22 14 27.3	0.5	1.8	0.13
23	11 35.3	19 39 27.43	22 0 46.9	0.5	1.8	0.13	7	8 28.3	19 33 16.75	22 14 37.3	0.5	1.8	0.13
24	11 31.2	19 39 17.34	22 1 10.9	0.5	1.8	0.13	8	8 24.3	19 33 12.04	22 14 46.8	0.5	1.8	0.13
25	11 27.1	19 39 7.28	22 1 34.7	0.5	1.8	0.13	9	8 20.3	19 33 7.52	22 14 55.9	0.5	1.8	0.13
26	11 23.0	19 38 57.26	22 1 58.4	0.5	1.8	0.13	10	8 16.3	19 33 3.18	22 15 4.6	0.5	1.8	0.13
27	11 18.9	19 38 47.28	22 2 21.9	0.5	1.8	0.13	11	8 12.3	19 32 59.03	22 15 12.8	0.5	1.8	0.13
28	11 14.8	19 38 37.35	22 2 45.3	0.5	1.8	0.13	12	8 8.3	19 32 55.08	22 15 20.5	0.5	1.8	0.13
29	11 10.7	19 38 27.47	22 3 8.5	0.5	1.8	0.13	13	8 4.3	19 32 51.33	22 15 27.8	0.5	1.8	0.13
30	11 6.6	19 38 17.64	22 3 31.5	0.5	1.8	0.13	14	8 0.3	19 32 47.77	22 15 34.7	0.5	1.8	0.13
31	11 2.5	19 38 7.87	22 3 54.2	0.5	1.8	0.13	15	7 56.3	19 32 44.41	22 15 41.1	0.5	1.7	0.13
Aug. 1	10 58.5	19 37 58.16	22 4 16.7	0.5	1.8	0.13	16	7 52.3	19 32 41.25	22 15 47.1	0.5	1.7	0.13
2	10 54.4	19 37 48.52	22 4 39.0	0.5	1.8	0.13	17	7 48.3	19 32 38.28	22 15 52.6	0.5	1.7	0.13
3	10 50.3	19 37 38.95	22 5 1.1	0.5	1.8	0.13	18	7 44.4	19 32 35.52	22 15 57.6	0.5	1.7	0.13
4	10 46.2	19 37 29.45	22 5 23.0	0.5	1.8	0.13	19	7 40.4	19 32 32.97	22 16 2.2	0.5	1.7	0.13
5	10 42.1	19 37 20.03	22 5 44.6	0.5	1.8	0.13	20	7 36.4	19 32 30.61	22 16 6.3	0.5	1.7	0.13
6	10 38.0	19 37 10.70	22 6 6.0	0.5	1.8	0.13	21	7 32.4	19 32 28.46	22 16 9.9	0.5	1.7	0.13
7	10 33.9	19 37 1.45	22 6 27.2	0.5	1.8	0.13	22	7 28.4	19 32 26.52	22 16 13.0	0.5	1.7	0.13
8	10 29.8	19 36 52.30	22 6 48.1	0.5	1.8	0.13	23	7 24.5	19 32 24.79	22 16 15.7	0.5	1.7	0.13
9	10 25.8	19 36 43.24	22 7 8.7	0.5	1.8	0.13	24	7 20.6	19 32 23.26	22 16 17.9	0.5	1.7	0.13
10	10 21.7	19 36 34.28	22 7 29.0	0.5	1.8	0.13	25	7 16.6	19 32 21.95	22 16 19.7	0.5	1.7	0.12
11	10 17.6	19 36 25.42	22 7 49.0	0.5	1.8	0.13	26	7 12.7	19 32 20.84	22 16 21.1	0.5	1.7	0.12
12	10 13.5	19 36 16.67	22 8 8.7	0.5	1.8	0.13	27	7 8.7	19 32 19.95	22 16 21.9	0.5	1.7	0.12
13	10 9.4	19 36 8.03	22 8 28.2	0.5	1.8	0.13	28	7 4.8	19 32 19.27	22 16 22.2	0.5	1.7	0.12
14	10 5.4	19 35 59.49	22 8 47.3	0.5	1.8	0.13	29	7 0.8	19 32 18.80	22 16 22.0	0.5	1.7	0.12
15	10 1.3	19 35 51.07	22 9 6.1	0.5	1.8	0.13	30	6 56.9	19 32 18.55	22 16 21.5	0.5	1.7	0.12
16	9 57.2	19 35 42.78	22 9 24.5	0.5	1.8	0.13	Oct. 1	6 53.0	19 32 18.52	22 16 20.4	0.5	1.7	0.12
17	9 53.2	19 35 34.61	22 9 42.7	0.5	1.8	0.13	2	6 49.0	19 32 18.71	22 16 18.8	0.5	1.7	0.12
18	9 49.1	19 35 26.57	22 10 0.5	0.5	1.8	0.13	3	6 45.1	19 32 19.11	22 16 16.8	0.5	1.7	0.12
19	9 45.0	19 35 18.65	22 10 17.9	0.5	1.8	0.13	4	6 41.2	19 32 19.73	22 16 14.3	0.5	1.7	0.12
20	9 41.0	19 35 10.86	22 10 35.0	0.5	1.8	0.13	5	6 37.3	19 32 20.57	22 16 11.2	0.5	1.7	0.12
21	9 36.9	19 35 3.21	22 10 51.7	0.5	1.8	0.13	6	6 33.4	19 32 21.63	22 16 7.7	0.5	1.7	0.12
22	9 32.9	19 34 55.70	22 11 8.2	0.5	1.8	0.13	7	6 29.5	19 32 22.90	22 16 3.8	0.5	1.7	0.12
23	9 28.8	19 34 48.33	22 11 24.3	0.5	1.8	0.13	8	6 25.5	19 32 24.39	22 15 59.4	0.5	1.7	0.12
24	9 24.8	19 34 41.11	22 11 39.9	0.5	1.8	0.13	9	6 21.6	19 32 26.11	22 15 54.4	0.5	1.7	0.12
25	9 20.7	19 34 34.04	22 11 55.1	0.5	1.8	0.13	10	6 17.7	19 32 28.04	22 15 49.0	0.4	1.7	0.12
26	9 16.7	19 34 27.11	22 12 10.0	0.5	1.8	0.13	11	6 13.8	19 32 30.18	22 15 43.1	0.4	1.7	0.12
27	9 12.6	19 34 20.33	22 12 24.5	0.5	1.8	0.13	12	6 10.0	19 32 32.54	22 15 36.8	0.4	1.7	0.12
28	9 8.6	19 34 13.71	22 12 38.6	0.5	1.8	0.13	13	6 6.1	19 32 35.12	22 15 29.9	0.4	1.7	0.12
29	9 4.5	19 34 7.25	22 12 52.3	0.5	1.8	0.13	14	6 2.2	19 32 37.92	22 15 22.6	0.4	1.7	0.12
30	9 0.5	19 34 0.95	22 13 5.6	0.5	1.8	0.13	15	5 58.3	19 32 40.93	22 15 14.8	0.4	1.7	0.12
31	8 56.5	19 33 54.82	22 13 18.5	0.5	1.8	0.13	16	5 54.4	19 32 44.14	22 15 6.5	0.4	1.7	0.12
Sept. 1	8 52.4	19 33 48.85	22 13 31.0	0.5	1.8	0.13	17	5 50.5	19 32 47.56	22 14 57.7	0.4	1.7	0.12

## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid.T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	12 38.3	7 18 19.85	+21 30 33.7	0.3	1.3	0.10	Feb. 14	9 36.4	7 13 19.50	+21 40 26.8	0.3	1.3	0.09
1	12 34.3	7 18 12.72	21 30 47.5	0.3	1.3	0.10	15	9 32.4	7 13 14.24	21 40 37.6	0.3	1.3	0.09
2	12 30.2	7 18 5.57	21 31 1.4	0.3	1.3	0.10	16	9 28.4	7 13 9.09	21 40 48.3	0.3	1.3	0.09
3	12 26.2	7 17 58.41	21 31 15.3	0.3	1.3	0.10	17	9 24.4	7 13 4.04	21 40 58.8	0.3	1.3	0.09
4	12 22.1	7 17 51.22	21 31 29.2	0.3	1.3	0.10	18	9 20.3	7 12 59.09	21 41 9.1	0.3	1.3	0.09
5	12 18.0	7 17 44.02	+21 31 43.1	0.3	1.3	0.10	19	9 16.3	7 12 54.25	+21 41 19.3	0.3	1.3	0.09
6	12 14.0	7 17 36.82	21 31 57.1	0.3	1.3	0.10	20	9 12.3	7 12 49.52	21 41 29.3	0.3	1.3	0.09
7	12 10.0	7 17 29.61	21 32 11.1	0.3	1.3	0.10	21	9 8.3	7 12 44.89	21 41 39.1	0.3	1.3	0.09
8	12 5.9	7 17 22.40	21 32 25.1	0.3	1.3	0.10	22	9 4.3	7 12 40.38	21 41 48.7	0.3	1.3	0.09
9	12 1.9	7 17 15.18	21 32 39.2	0.3	1.3	0.10	23	9 0.3	7 12 35.98	21 41 58.1	0.3	1.3	0.09
10	11 57.8	7 17 7.97	+21 32 53.3	0.3	1.3	0.10	24	8 56.3	7 12 31.69	+21 42 7.3	0.3	1.3	0.09
11	11 53.8	7 17 0.75	21 33 7.4	0.3	1.3	0.10	25	8 52.3	7 12 27.52	21 42 16.3	0.3	1.3	0.09
12	11 49.7	7 16 53.55	21 33 21.4	0.3	1.3	0.10	26	8 48.3	7 12 23.47	21 42 25.2	0.3	1.3	0.09
13	11 45.7	7 16 46.37	21 33 35.4	0.3	1.3	0.10	27	8 44.3	7 12 19.54	21 42 33.8	0.3	1.3	0.09
14	11 41.6	7 16 39.21	21 33 49.4	0.3	1.3	0.10	28	8 40.3	7 12 15.73	21 42 42.2	0.3	1.3	0.09
15	11 37.5	7 16 32.07	+21 34 3.4	0.3	1.3	0.10	Mar. 1	8 36.3	7 12 12.04	+21 42 50.4	0.3	1.3	0.09
16	11 33.5	7 16 24.94	21 34 17.4	0.3	1.3	0.10	2	8 32.3	7 12 8.48	21 42 58.4	0.3	1.3	0.09
17	11 29.4	7 16 17.83	21 34 31.3	0.3	1.3	0.10	3	8 28.3	7 12 5.04	21 43 6.2	0.3	1.3	0.09
18	11 25.3	7 16 10.75	21 34 45.2	0.3	1.3	0.10	4	8 24.3	7 12 1.73	21 43 13.8	0.3	1.3	0.09
19	11 21.3	7 16 3.70	21 34 59.0	0.3	1.3	0.10	5	8 20.4	7 11 58.54	21 43 21.1	0.3	1.3	0.09
20	11 17.3	7 15 56.68	+21 35 12.8	0.3	1.3	0.10	6	8 16.4	7 11 55.48	+21 43 28.3	0.3	1.3	0.09
21	11 13.3	7 15 49.68	21 35 26.5	0.3	1.3	0.10	7	8 12.4	7 11 52.56	21 43 35.1	0.3	1.3	0.09
22	11 9.2	7 15 42.73	21 35 40.2	0.3	1.3	0.10	8	8 8.4	7 11 49.76	21 43 41.8	0.3	1.3	0.09
23	11 5.2	7 15 35.83	21 35 53.8	0.3	1.3	0.10	9	8 4.4	7 11 47.10	21 43 48.3	0.3	1.3	0.09
24	11 1.1	7 15 28.97	21 36 7.3	0.3	1.3	0.10	10	8 0.5	7 11 44.57	21 43 54.7	0.3	1.3	0.09
25	10 57.1	7 15 22.14	+21 36 20.8	0.3	1.3	0.10	11	7 56.5	7 11 42.18	+21 44 0.8	0.3	1.3	0.09
26	10 53.1	7 15 15.37	21 36 34.2	0.3	1.3	0.10	12	7 52.5	7 11 39.92	21 44 6.6	0.3	1.3	0.09
27	10 49.0	7 15 8.65	21 36 47.5	0.3	1.3	0.10	13	7 48.5	7 11 37.80	21 44 12.2	0.3	1.3	0.09
28	10 44.9	7 15 1.99	21 37 0.7	0.3	1.3	0.10	14	7 44.6	7 11 35.82	21 44 17.5	0.3	1.3	0.09
29	10 40.9	7 14 55.39	21 37 13.7	0.3	1.3	0.09	15	7 40.6	7 11 33.98	21 44 22.7	0.3	1.3	0.09
30	10 36.9	7 14 48.85	+21 37 26.6	0.3	1.3	0.09	16	7 36.7	7 11 32.28	+21 44 27.6	0.3	1.3	0.09
31	10 32.8	7 14 42.36	21 37 39.5	0.3	1.3	0.09	17	7 32.7	7 11 30.72	21 44 32.3	0.3	1.3	0.09
Feb. 1	10 28.8	7 14 35.94	21 37 52.3	0.3	1.3	0.09	18	7 28.7	7 11 29.30	21 44 36.8	0.3	1.3	0.09
2	10 24.7	7 14 29.59	21 38 5.0	0.3	1.3	0.09	19	7 24.8	7 11 28.01	21 44 41.0	0.3	1.3	0.09
3	10 20.7	7 14 23.31	21 38 17.6	0.3	1.3	0.09	20	7 20.8	7 11 26.87	21 44 45.0	0.3	1.3	0.09
4	10 16.7	7 14 17.11	+21 38 30.0	0.3	1.3	0.09	21	7 16.9	7 11 25.87	+21 44 48.7	0.3	1.3	0.09
5	10 12.6	7 14 10.97	21 38 42.3	0.3	1.3	0.09	22	7 12.9	7 11 25.01	21 44 52.2	0.3	1.3	0.09
6	10 8.6	7 14 4.91	21 38 54.5	0.3	1.3	0.09	23	7 9.0	7 11 24.29	21 44 55.5	0.3	1.3	0.09
7	10 4.6	7 13 58.93	21 39 6.5	0.3	1.3	0.09	24	7 5.1	7 11 23.71	21 44 58.5	0.3	1.3	0.09
8	10 0.6	7 13 53.03	21 39 18.4	0.3	1.3	0.09	25	7 1.1	7 11 23.28	21 45 1.3	0.3	1.3	0.09
9	9 56.5	7 13 47.21	+21 39 30.2	0.3	1.3	0.09	26	6 57.2	7 11 22.99	+21 45 3.8	0.3	1.3	0.09
10	9 52.5	7 13 41.48	21 39 41.8	0.3	1.3	0.09	27	6 53.3	7 11 22.84	21 45 6.0	0.3	1.3	0.09
11	9 48.5	7 13 35.84	21 39 53.3	0.3	1.3	0.09	28	6 49.3	7 11 22.84	21 45 8.0	0.3	1.3	0.09
12	9 44.4	7 13 30.30	21 40 4.6	0.3	1.3	0.09	29	6 45.3	7 11 22.98	21 45 9.8	0.3	1.3	0.09
13	9 40.4	7 13 24.85	21 40 15.8	0.3	1.3	0.09	30	6 41.4	7 11 23.26	21 45 11.3	0.3	1.3	0.09
14	9 36.4	7 13 19.50	+21 40 26.8	0.3	1.3	0.09	31	6 37.5	7 11 23.69	+21 45 12.6	0.3	1.3	0.09
15	9 32.4	7 13 14.24	+21 40 37.6	0.3	1.3	0.09	Apr. 1	6 33.6	7 11 24.26	+21 45 13.6	0.3	1.3	0.09



## FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semi- diam.	Sid. T. of S.D. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Apr. 1	6 33.6	7 11 24.26	+21 45 13.6	0.3	1.3	0.09	Nov. 16	15 50.0	7 32 13.42	+21 6 16.2	0.3	1.3	0.09
2	6 29.7	7 11 24.97	21 45 14.4	0.3	1.3	0.09	17	15 46.1	7 32 10.21	21 6 22.8	0.3	1.3	0.09
3	6 25.7	7 11 25.83	21 45 14.9	0.3	1.3	0.09	18	15 42.1	7 32 6.87	21 6 29.7	0.3	1.3	0.09
4	6 21.8	7 11 26.83	21 45 15.2	0.3	1.3	0.09	19	15 38.1	7 32 3.41	21 6 36.9	0.3	1.3	0.09
5	6 17.9	7 11 27.97	21 45 15.2	0.3	1.3	0.09	20	15 34.1	7 31 59.83	21 6 44.3	0.3	1.3	0.09
6	6 14.0	7 11 29.26	+21 45 15.0	0.3	1.3	0.09	21	15 30.1	7 31 56.12	+21 6 52.0	0.3	1.3	0.09
7	6 10.1	7 11 30.69	21 45 14.6	0.3	1.3	0.09	22	15 26.1	7 31 52.27	21 7 0.0	0.3	1.3	0.09
8	6 6.2	7 11 32.26	21 45 13.9	0.3	1.3	0.09	23	15 22.1	7 31 48.31	21 7 8.3	0.3	1.3	0.09
9	6 2.3	7 11 33.97	21 45 13.0	0.3	1.3	0.09	24	15 18.1	7 31 44.24	21 7 16.8	0.3	1.3	0.09
10	5 58.4	7 11 35.83	21 45 11.8	0.3	1.3	0.09	25	15 14.1	7 31 40.05	21 7 25.6	0.3	1.3	0.09
Oct. 12	18 8.1	7 32 39.34	+21 5 41.4	0.3	1.3	0.09	26	15 10.1	7 31 35.74	+21 7 34.7	0.3	1.3	0.09
13	18 4.2	7 32 41.01	21 5 37.1	0.3	1.3	0.09	27	15 6.1	7 31 31.32	21 7 44.0	0.3	1.3	0.09
14	18 0.3	7 32 42.54	21 5 33.1	0.3	1.3	0.09	28	15 2.1	7 31 26.79	21 7 53.5	0.3	1.3	0.09
15	17 56.4	7 32 43.92	21 5 29.3	0.3	1.3	0.09	29	14 58.1	7 31 22.14	21 8 3.4	0.3	1.3	0.09
16	17 52.4	7 32 45.16	21 5 25.8	0.3	1.3	0.09	30	14 54.1	7 31 17.38	21 8 13.5	0.3	1.3	0.09
17	17 48.5	7 32 46.26	+21 5 22.8	0.3	1.3	0.09	Dec. 1	14 50.1	7 31 12.51	+21 8 23.8	0.3	1.3	0.09
18	17 44.6	7 32 47.21	21 5 20.1	0.3	1.3	0.09	2	14 46.0	7 31 7.54	21 8 34.4	0.3	1.3	0.09
19	17 40.7	7 32 48.02	21 5 17.6	0.3	1.3	0.09	3	14 42.0	7 31 2.46	21 8 45.3	0.3	1.3	0.09
20	17 36.8	7 32 48.69	21 5 15.3	0.3	1.3	0.09	4	14 38.0	7 30 57.28	21 8 56.4	0.3	1.3	0.09
21	17 32.8	7 32 49.22	21 5 13.4	0.3	1.3	0.09	5	14 34.0	7 30 52.01	21 9 7.6	0.3	1.3	0.09
22	17 28.9	7 32 49.61	+21 5 11.8	0.3	1.3	0.09	6	14 30.0	7 30 46.65	+21 9 19.0	0.3	1.3	0.09
23	17 25.0	7 32 49.86	21 5 10.6	0.3	1.3	0.09	7	14 25.9	7 30 41.20	21 9 30.6	0.3	1.3	0.09
24	17 21.1	7 32 49.97	21 5 9.7	0.3	1.3	0.09	8	14 21.9	7 30 35.65	21 9 42.4	0.3	1.3	0.09
25	17 17.2	7 32 49.93	21 5 9.1	0.3	1.3	0.09	9	14 17.9	7 30 30.01	21 9 54.5	0.3	1.3	0.09
26	17 13.2	7 32 49.75	21 5 8.8	0.3	1.3	0.09	10	14 13.9	7 30 24.28	21 10 6.8	0.3	1.3	0.09
27	17 9.3	7 32 49.42	+21 5 8.9	0.3	1.3	0.09	11	14 9.8	7 30 18.46	+21 10 19.4	0.3	1.3	0.09
28	17 5.3	7 32 48.95	21 5 9.4	0.3	1.3	0.09	12	14 5.8	7 30 12.56	21 10 32.1	0.3	1.3	0.09
29	17 1.4	7 32 48.34	21 5 10.2	0.3	1.3	0.09	13	14 1.8	7 30 6.58	21 10 45.0	0.3	1.3	0.09
30	16 57.4	7 32 47.58	21 5 11.3	0.3	1.3	0.09	14	13 57.7	7 30 0.52	21 10 58.1	0.3	1.3	0.09
31	16 53.5	7 32 46.68	21 5 12.6	0.3	1.3	0.09	15	13 53.7	7 29 54.38	21 11 11.4	0.3	1.3	0.09
Nov. 1	16 49.6	7 32 45.64	+21 5 14.2	0.3	1.3	0.09	16	13 49.7	7 29 48.17	+21 11 24.7	0.3	1.3	0.09
2	16 45.6	7 32 44.46	21 5 16.1	0.3	1.3	0.09	17	13 45.7	7 29 41.88	21 11 38.2	0.3	1.3	0.09
3	16 41.7	7 32 43.14	21 5 18.3	0.3	1.3	0.09	18	13 41.6	7 29 35.53	21 11 51.9	0.3	1.3	0.09
4	16 37.7	7 32 41.67	21 5 20.8	0.3	1.3	0.09	19	13 37.6	7 29 29.12	21 12 5.8	0.3	1.3	0.09
5	16 33.8	7 32 40.07	21 5 23.7	0.3	1.3	0.09	20	13 33.5	7 29 22.64	21 12 19.9	0.3	1.3	0.09
6	16 29.8	7 32 38.33	+21 5 26.9	0.3	1.3	0.09	21	13 29.5	7 29 16.10	+21 12 34.1	0.3	1.3	0.09
7	16 25.8	7 32 36.44	21 5 30.4	0.3	1.3	0.09	22	13 25.5	7 29 9.50	21 12 48.3	0.3	1.3	0.09
8	16 21.9	7 32 34.42	21 5 34.2	0.3	1.3	0.09	23	13 21.4	7 29 2.84	21 13 2.6	0.3	1.3	0.09
9	16 17.9	7 32 32.25	21 5 38.4	0.3	1.3	0.09	24	13 17.4	7 28 56.13	21 13 17.0	0.3	1.3	0.09
10	16 13.9	7 32 29.96	21 5 42.9	0.3	1.3	0.09	25	13 13.4	7 28 49.36	21 13 31.6	0.3	1.3	0.09
11	16 9.9	7 32 27.54	+21 5 47.7	0.3	1.3	0.09	26	13 9.3	7 28 42.55	+21 13 46.3	0.3	1.3	0.09
12	16 6.0	7 32 24.98	21 5 52.8	0.3	1.3	0.09	27	13 5.2	7 28 35.69	21 14 1.1	0.3	1.3	0.09
13	16 2.0	7 32 22.28	21 5 58.2	0.3	1.3	0.09	28	13 1.2	7 28 28.80	21 14 16.1	0.3	1.3	0.09
14	15 58.0	7 32 19.46	21 6 3.9	0.3	1.3	0.09	29	12 57.1	7 28 21.87	21 14 31.2	0.3	1.3	0.09
15	15 54.0	7 32 16.50	21 6 9.9	0.3	1.3	0.09	30	12 53.1	7 28 14.89	21 14 46.4	0.3	1.3	0.09
16	15 50.0	7 32 13.42	+21 6 16.2	0.3	1.3	0.09	31	12 49.0	7 28 7.87	+21 15 1.6	0.3	1.3	0.09
17	15 46.1	7 32 10.21	+21 6 22.8	0.3	1.3	0.09	32	12 45.0	7 28 0.83	+21 15 16.8	0.3	1.3	0.09



## PART III



## PHENOMENA

## ECLIPSES IN 1910.

In the year 1910 there will be four eclipses, two of the Sun and two of the Moon.

I.—*A Total Eclipse of the Sun*, 1910, May 8, invisible at Washington.

## ELEMENTS OF THE ECLIPSE.

Greenwich mean time of  $\delta$  in right ascension, May  $\overset{d}{8} \overset{h}{17} \overset{m}{3} \overset{s}{22.5}$

Sun and Moon's R. A.	$\overset{h}{3} \overset{m}{0} \overset{s}{53.90}$	Hourly motions	$\overset{s}{9.71}$ and $\overset{s}{147.52}$
Sun's declination	$17 \ 6 \ 59.6 \ N.$	Hourly motion	$0 \ 40.7 \ N.$
Moon's declination	$16 \ 4 \ 48.7 \ N.$	Hourly motion	$13 \ 56.3 \ N.$
Sun's equa. hor. parallax	$8.7$	Sun's true semidiameter	$15 \ 50.4$
Moon's equa. hor. parallax	$61 \ 17.9$	Moon's true semidiameter	$16 \ 41.4$

## CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
Eclipse begins	May $\overset{d}{8} \overset{h}{15} \overset{m}{38.4}$	$61 \ 33.7 \ E.$	$55 \ 56.4 \ S.$
Central eclipse begins	$8 \ 17 \ 9.3$	$112 \ 1.5 \ E.$	$72 \ 37.1 \ S.$
Central eclipse at noon	— — —	— — —	— — —
Central eclipse ends	$8 \ 18 \ 15.6$	$156 \ 12.6 \ E.$	$46 \ 31.2 \ S.$
Eclipse ends	$8 \ 19 \ 46.4$	$147 \ 33.2 \ E.$	$15 \ 36.0 \ S.$

II.—*A Total Eclipse of the Moon*, 1910, May 23, visible at Washington; the beginning visible generally in the central and western portions of Africa, southwest Europe, South America, North America excepting Alaska, and the southern Pacific Ocean; the ending visible generally in South America, North America excepting Alaska, and the central and southern Pacific Ocean.

## ELEMENTS OF THE ECLIPSE.

Greenwich mean time of  $\delta$  in right ascension, May  $\overset{d}{23} \overset{h}{17} \overset{m}{48} \overset{s}{53.2}$

Sun's right ascension	$\overset{h}{4} \overset{m}{0} \overset{s}{20.72}$	Hourly motion	$\overset{s}{10.06}$
Moon's right ascension	$16 \ 0 \ 20.72$	Hourly motion	$122.93$
Sun's declination	$20 \ 36 \ 26.9 \ N.$	Hourly motion	$0 \ 28.6 \ N.$
Moon's declination	$20 \ 59 \ 4.2 \ S.$	Hourly motion	$8 \ 37.3 \ S.$
Sun's equa. hor. parallax	$8.7$	Sun's true semidiameter	$15 \ 47.5$
Moon's equa. hor. parallax	$54 \ 17.4$	Moon's true semidiameter	$14 \ 46.9$

## CIRCUMSTANCES OF THE ECLIPSE.

Moon enters penumbra	May $\overset{d}{23} \overset{h}{14} \overset{m}{32.5}$	} Greenwich Mean Time.
Moon enters shadow	$23 \ 15 \ 46.4$	
Total eclipse begins	$23 \ 17 \ 9.0$	
Middle of the eclipse	$23 \ 17 \ 34.3$	
Total eclipse ends	$23 \ 17 \ 59.6$	
Moon leaves shadow	$23 \ 19 \ 22.3$	
Moon leaves penumbra	$23 \ 20 \ 36.2$	

Contacts of shadow with Moon's limb.

Angles of position from the north point.

The Moon being in the zenith  
in longitude from Greenwich, and in latitude.

First	$84 \text{ to } E.$	$58 \ 26 \ W.$	$20 \ 41 \ S.$
Last	$49 \text{ to } W.$	$110 \ 42 \ W.$	$21 \ 12 \ S.$

Magnitude of the eclipse = 1.099 (Moon's diameter = 1.0).

III.—*A Partial Eclipse of the Sun, 1910, November 1, invisible at Washington.*

## ELEMENTS OF THE ECLIPSE.

Greenwich mean time of $\delta$ in right ascension, November				d	h	m	s
				1	13	11	35.1
Sun and Moon's R. A.	h	m	s	Hourly motions			
	14	25	25.58	9.80 and 111.78			
Sun's declination	14	25	21.1 S.	Hourly motion			
Moon's declination	13	22	36.3 S.	12 2.5 S.			
Sun's equa. hor. parallax	8.9			Sun's true semidiameter			
Moon's equa. hor. parallax	54	4.3		16 7.2			
				Moon's true semidiameter			
				14 43.4			

## CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
Eclipse begins	November 1 11 51.1	118 30.2 E.	63 3.5 N.
Greatest eclipse	1 14 8.6	155 14.0 W.	62 2.0 N.
Eclipse ends	1 16 26.4	165 23.2 W.	17 35.3 N.

Magnitude of greatest eclipse = 0.852 (Sun's diameter = 1.0).

IV.—*A Total Eclipse of the Moon, 1910, November 16, visible at Washington; the beginning visible generally in Africa, Europe, central and western Asia, South America and eastern North America; the ending visible generally in Africa, Europe, western Asia, North and South America.*

## ELEMENTS OF THE ECLIPSE.

Greenwich mean time of $g$ in right ascension, November				d	h	m	s
				16	12	36	11.1
Sun's right ascension	h	m	s	Hourly motion			
	15	25	38.35	10.31			
Moon's right ascension	3	25	38.35	Hourly motion			
				152.73			
Sun's declination	18	43	52.7 S.	Hourly motion			
Moon's declination	19	10	37.0 N.	12 52.8 N.			
Sun's equa. hor. parallax	8.9			Sun's true semidiameter			
Moon's equa. hor. parallax	61	28.3		16 10.8			
				Moon's true semidiameter			
				16 44.2			

## CIRCUMSTANCES OF THE ECLIPSE.

Moon enters penumbra	November 16 9 45.6	} Greenwich Mean Time.
Moon enters shadow	16 10 44.0	
Total eclipse begins	16 11 54.9	
Middle of the eclipse	16 12 20.8	
Total eclipse ends	16 12 46.8	
Moon leaves shadow	16 13 57.7	
Moon leaves penumbra	16 14 56.1	

Contacts of shadow  
with Moon's limb.

Angles of position  
from the north point.

The Moon being in the zenith  
in longitude  
from Greenwich,  
and in latitude.

First	93 to E.	14 6 E.	18 46 N.
Last	134 to W.	32 23 W.	19 28 N.

Magnitude of the eclipse = 1.131 (Moon's diameter = 1.0).

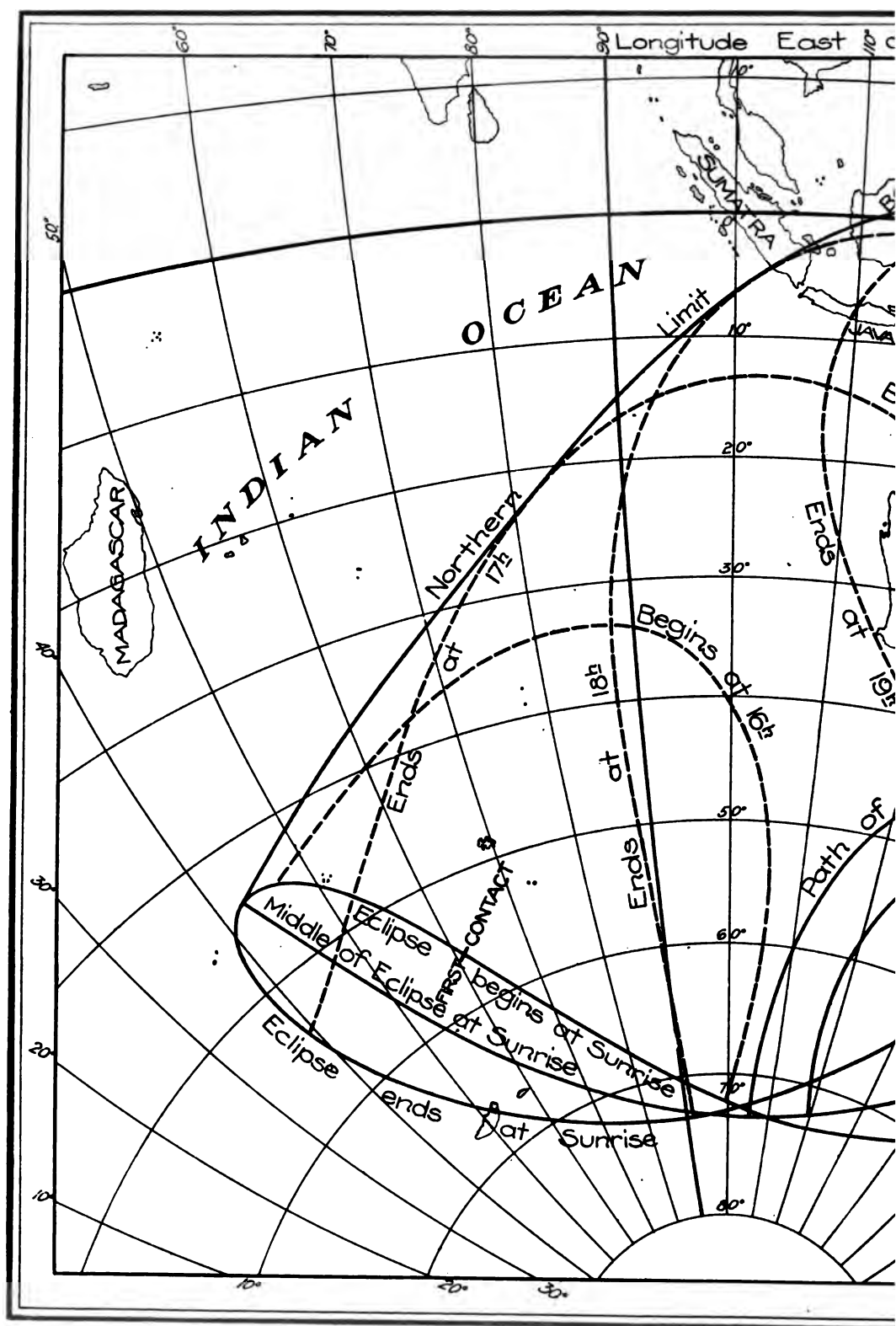
The regions within which the eclipses of the Sun are visible are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich mean time of beginning and ending at any place may be found with an uncertainty which will vary from three or four minutes for a high Sun to fifteen or twenty minutes when the Sun is near the horizon.

**BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE  
OF THE SUN, 1910, MAY 8.**

Greenwich Mean Time.	Co-ordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	$x$	$y$	Log sin $d$	Log cos $d$	$\mu$	$l_1$	$l_2$
h m							
15 30	-0.842 38	-1.354 22	+9.468 46	+9.980 36	233 24.4	+0.531 82	-0.014 03
40	0.752 18	1.318 07	9.468 51	9.980 35	235 54.4	0.531 83	0.014 02
50	0.661 97	1.281 93	9.468 55	9.980 35	238 24.4	0.531 84	0.014 01
16 0	-0.571 76	-1.245 80	+9.468 60	+9.980 35	240 54.5	+0.531 85	-0.013 99
10	0.481 55	1.209 66	9.468 64	9.980 34	243 24.5	0.531 86	0.013 98
20	0.391 34	1.173 53	9.468 68	9.980 34	245 54.5	0.531 87	0.013 97
30	0.301 12	1.137 40	9.468 73	9.980 33	248 24.5	0.531 88	0.013 96
40	0.210 90	1.101 27	9.468 77	9.980 33	250 54.5	0.531 89	0.013 96
50	0.120 68	1.065 14	9.468 82	9.980 32	253 24.6	0.531 90	0.013 95
17 0	-0.030 45	-1.029 02	+9.468 86	+9.980 32	255 54.6	+0.531 91	-0.013 94
10	+0.059 78	0.992 90	9.468 90	9.980 32	258 24.6	0.531 91	0.013 93
20	0.150 01	0.956 79	9.468 95	9.980 31	260 54.6	0.531 92	0.013 93
30	0.240 24	0.920 67	9.468 99	9.980 31	263 24.6	0.531 92	0.013 92
40	0.330 47	0.884 56	9.469 04	9.980 30	265 54.7	0.531 93	0.013 92
50	0.420 71	0.848 46	9.469 08	9.980 30	268 24.7	0.531 93	0.013 92
18 0	+0.510 94	-0.812 36	+9.469 13	+9.980 30	270 54.7	+0.531 94	-0.013 91
10	0.601 18	0.776 26	9.469 17	9.980 29	273 24.7	0.531 94	0.013 91
20	0.691 41	0.740 16	9.469 21	9.980 29	275 54.7	0.531 94	0.013 91
30	0.781 65	0.704 07	9.469 26	9.980 28	278 24.8	0.531 94	0.013 91
40	0.871 89	0.667 98	9.469 30	9.980 28	280 54.8	0.531 94	0.013 91
50	0.962 12	0.631 90	9.469 35	9.980 27	283 24.8	0.531 94	0.013 91
19 0	+1.052 36	-0.595 82	+9.469 39	+9.980 27	285 54.8	+0.531 94	-0.013 91
10	1.142 59	0.559 74	9.469 43	9.980 27	288 24.8	0.531 93	0.013 91
20	1.232 83	0.523 67	9.469 48	9.980 26	290 54.9	0.531 93	0.013 91
30	1.323 06	0.487 60	9.469 52	9.980 26	293 24.9	0.531 93	0.013 92
40	1.413 29	0.451 54	9.469 57	9.980 25	295 54.9	0.531 92	0.013 92
50	+1.503 52	-0.415 49	+9.469 61	+9.980 25	298 24.9	+0.531 92	-0.013 93
Greenwich Mean Time.	Log $x'$ for 1 Minute.		Log $y'$ for 1 Minute.		Log $\mu'$ for 1 Minute.	Log Tangents of Angles of Cones.	
						Penumbra.	Shadow.
h m							
15 0	+7.9551		+7.5581		+1.1761	+7.66559	+7.66342
16 0	7.9552		7.5580		1.1761	7.66559	7.66342
17 0	7.9553		7.5578		1.1761	7.66558	7.66342
18 0	7.9554		7.5576		1.1761	7.66558	7.66341
19 0	7.9554		7.5573		1.1761	7.66558	7.66341
20 0	+7.9553		+7.5570		+1.1761	+7.66557	+7.66340



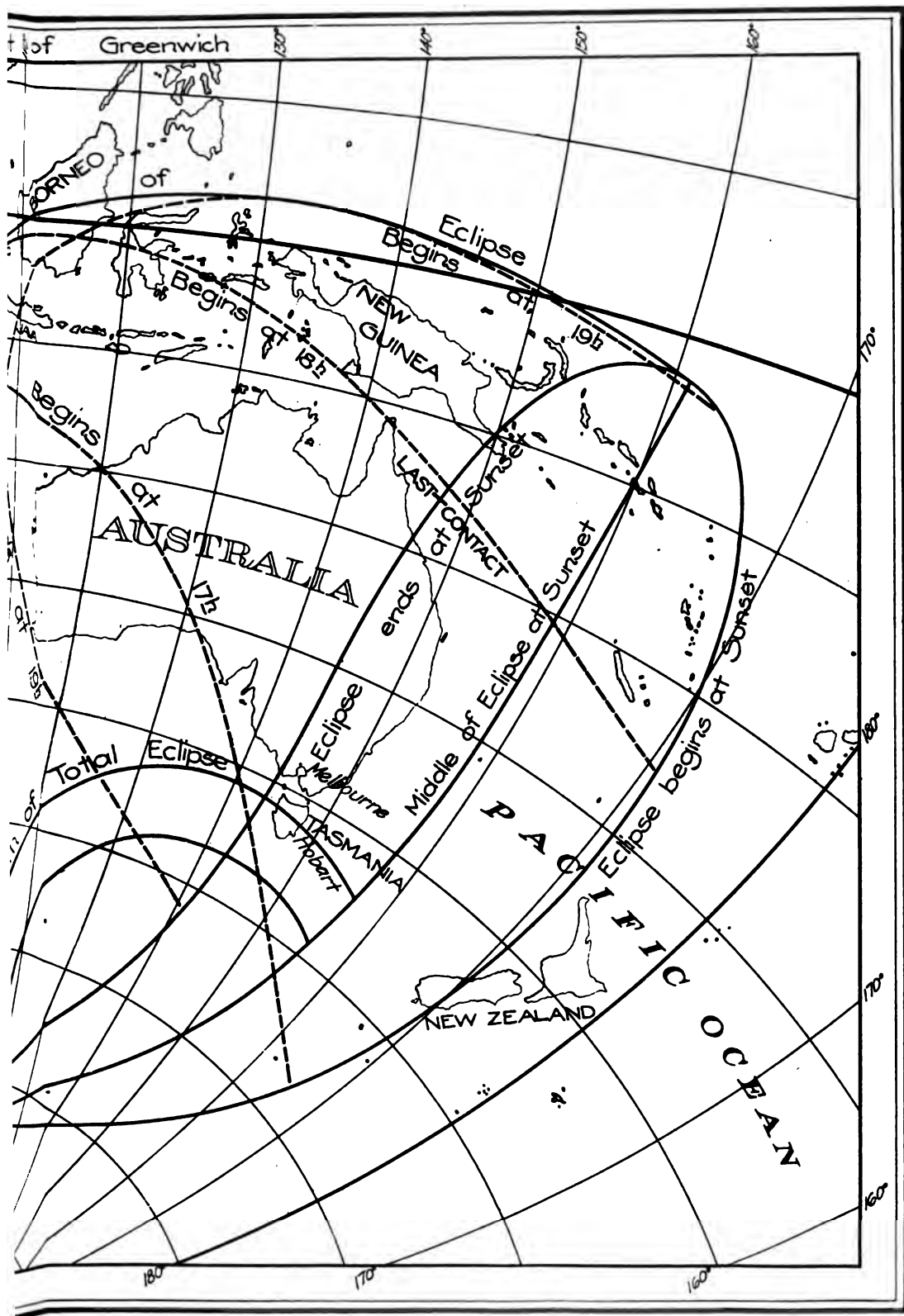
# TOTAL ECLIPSE



*Note:-The hours of beginning and ending.*



OF MAY 8<sup>TH</sup>. 1910



THE NORRIS PETERS CO., WASHINGTON, D. C.

ending are expressed in Greenwich Mean Time



PATH OF THE SHADOW DURING THE TOTAL ECLIPSE  
OF THE SUN, 1910, MAY 8.

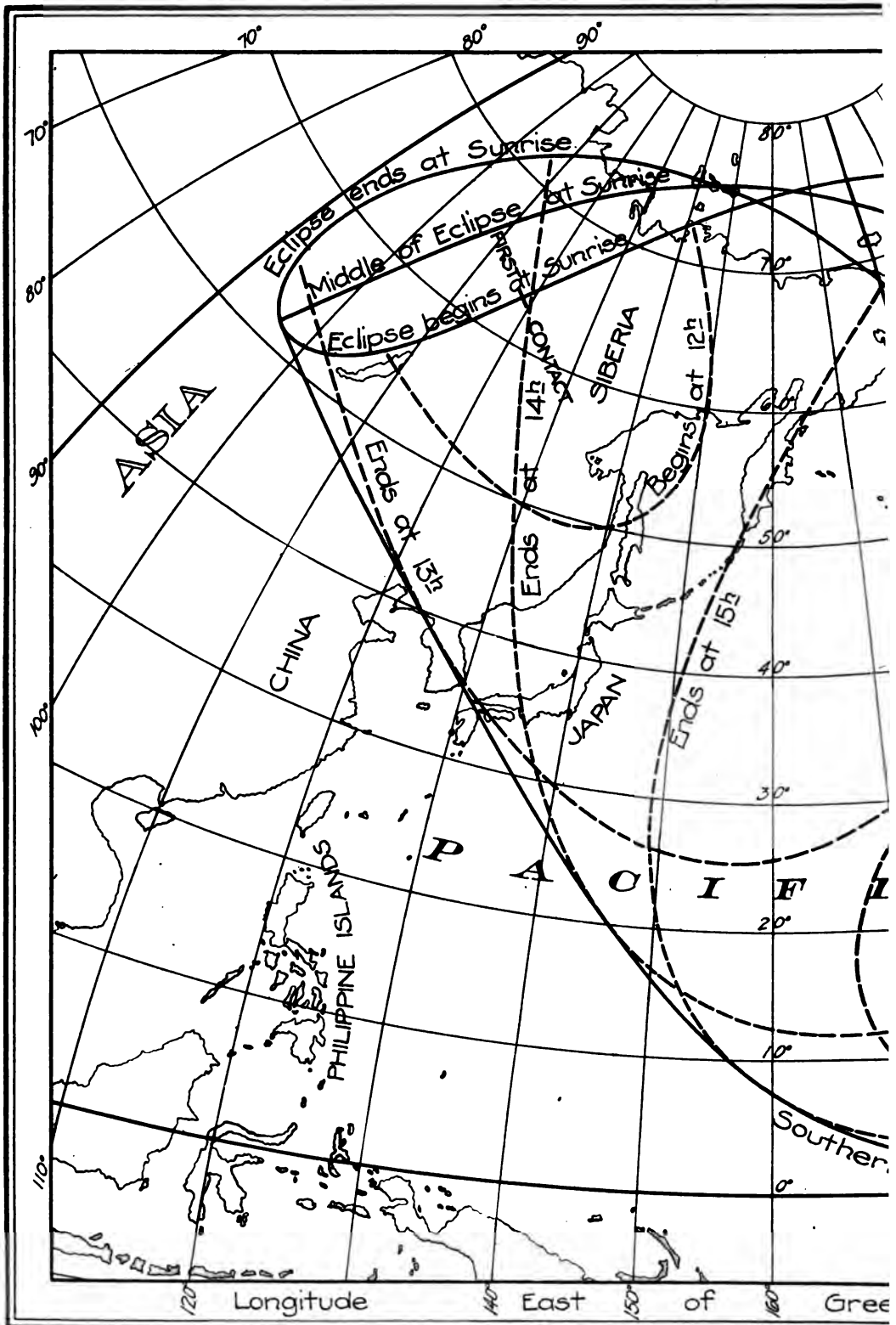
Greenwich Mean Time.	Northern Limit of Shadow Path.		Central Line.		Southern Limit of Shadow Path.		Duration of Totality on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
Limits.	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	m s
17 <sup>h</sup> 10 <sup>m</sup>	- 72 51.9	105 11.9 E.	- 72 37.1	112 1.5 E.	- 71 59.1	119 20.8 E.	. . .
15	62 32	108 11	68 47.9	111 4.6	. . .	. . .	3 26.8
20	58 11	111 12	61 49.3	113 8.4	67 35	117 12	3 46.3
25	55 0	113 29	57 57.4	115 28.3	61 41	118 17	3 56.7
	52 25	115 45	55 2.3	117 42.1	58 6	120 13	4 3.9
30	- 50 14	117 55 E.	- 52 39.5	119 52.1 E.	- 55 25	122 18 E.	4 9.0
35	48 21	120 3	50 38.8	122 1.5	53 13	124 27	4 12.2
40	46 43	122 11	48 55.3	124 13.1	51 23	126 41	4 13.9
45	45 17	124 23	47 26.4	126 30.0	49 50	129 4	4 14.0
50	44 2	126 41	46 10.7	128 55.6	48 33	131 39	4 12.5
55	42 59	129 10	45 8.2	131 34.8	47 32	134 34	4 9.4
18 0	- 42 8	131 54 E.	- 44 20.1	134 34.8 E.	- 46 49	138 0 E.	4 4.4
5	41 32	135 2	43 49.9	138 9.2	46 34	142 27	3 57.2
10	41 14	138 50	43 47.6	142 50.3	47 26	150 1	3 46.4
15	41 28	144 2	45 11.5	151 37.0	. . .	. . .	3 25.9
Limits.	- 44 24.6	156 38.7 E.	- 46 31.2	156 12.6 E.	- 48 53.9	155 36.6 E.	. . .

**BESSELIAN ELEMENTS OF THE PARTIAL ECLIPSE  
OF THE SUN, 1910, NOVEMBER 1.**

Greenwich Mean Time.	Co-ordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra on Fundamental Plane.
	<i>x</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	$\mu$	<i>l</i>
h m					°	
11 50	-0.625 43	+1.446 83	-9.395 89	+9.986 12	181 34.6	+0.571 85
12 0	-0.548 77	+1.412 11	-9.395 95	+9.986 12	184 4.6	+0.571 86
10	0.472 12	1.377 38	9.396 02	9.986 11	186 34.7	0.571 87
20	0.395 46	1.342 66	9.396 08	9.986 11	189 4.7	0.571 88
30	0.318 81	1.307 94	9.396 14	9.986 10	191 34.7	0.571 90
40	0.242 15	1.273 22	9.396 21	9.986 10	194 4.7	0.571 91
50	0.165 48	1.238 51	9.396 27	9.986 10	196 34.7	0.571 92
13 0	-0.088 82	+1.203 79	-9.396 33	+9.986 09	199 4.7	+0.571 93
10	-0.012 15	1.169 08	9.396 40	9.986 09	201 34.7	0.571 94
20	+0.064 52	1.134 37	9.396 46	9.986 08	204 4.8	0.571 95
30	0.141 19	1.099 66	9.396 52	9.986 08	206 34.8	0.571 96
40	0.217 86	1.064 96	9.396 59	9.986 08	209 4.8	0.571 96
50	0.294 53	1.030 25	9.396 65	9.986 07	211 34.8	0.571 97
14 0	+0.371 20	+0.995 55	-9.396 71	+9.986 07	214 4.8	+0.571 98
10	0.447 87	0.960 85	9.396 78	9.986 06	216 34.8	0.571 98
20	0.524 55	0.926 15	9.396 84	9.986 06	219 4.8	0.571 99
30	0.601 22	0.891 46	9.396 90	9.986 05	221 34.9	0.571 99
40	0.677 90	0.856 77	9.396 97	9.986 05	224 4.9	0.572 00
50	0.754 57	0.822 08	9.397 03	9.986 05	226 34.9	0.572 00
15 0	+0.831 25	+0.787 39	-9.397 09	+9.986 04	229 4.9	+0.572 01
10	0.907 92	0.752 71	9.397 15	9.986 04	231 34.9	0.572 01
20	0.984 60	0.718 03	9.397 22	9.986 03	234 4.9	0.572 01
30	1.061 27	0.683 35	9.397 28	9.986 03	236 34.9	0.572 01
40	1.137 95	0.648 67	9.397 34	9.986 03	239 5.0	0.572 02
50	1.214 62	0.614 00	9.397 41	9.986 02	241 35.0	0.572 02
16 0	+1.291 29	+0.579 33	-9.397 47	+9.986 02	244 5.0	+0.572 02
10	1.367 97	0.544 67	9.397 53	9.986 01	246 35.0	0.572 02
20	1.444 64	0.510 01	9.397 60	9.986 01	249 5.0	0.572 02
30	+1.521 31	+0.475 35	-9.397 66	+9.986 00	251 35.0	+0.572 02
Greenwich Mean Time.	Log <i>x'</i> for 1 Minute.		Log <i>y'</i> for 1 Minute.		Log $\mu'$ for 1 Minute.	Log Tangent of Angle of Cone— Penumbra.
h m						
11 0	+7.8844		-7.5407		+1.1761	+7.67338
12 0	7.8845		7.5406		1.1761	7.67338
13 0	7.8846		7.5405		1.1761	7.67339
14 0	7.8846		7.5403		1.1761	7.67339
15 0	7.8847		7.5401		1.1761	7.67340
16 0	7.8846		7.5399		1.1761	7.67340
17 0	+7.8846		-7.5397		+1.1761	+7.67341

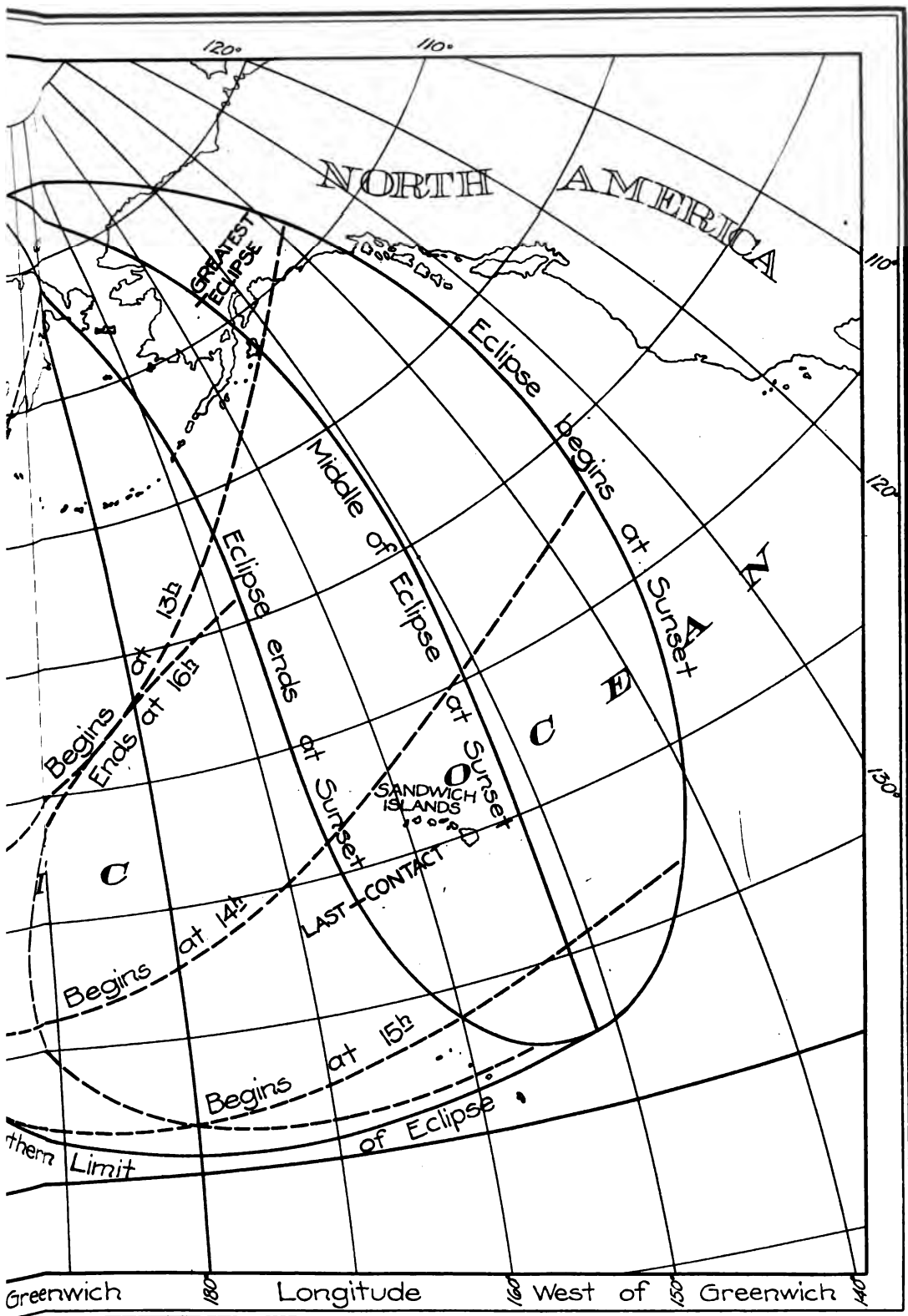


# PARTIAL ECLIPSE



Note:- The hours of beginning and ending

# ECLIPSE OF NOV. 1<sup>ST</sup>. 1910



THE NORRIS PETERS CO., WASHINGTON, D. C.

ending are expressed in Greenwich Mean Time





## WASHINGTON MEAN TIME.

## PHASES OF THE MOON.

New Moon.				First Quarter.				Full Moon.				Last Quarter.			
	d	h	m		d	h	m		d	h	m		d	h	m
January	10	18	42.9	January	17	17	12.3	January	24	18	42.3	January	2	20	18.5
February	9	8	4.7	February	16	1	24.2	February	23	10	27.5	February	1	18	18.8
March	10	19	4.1	March	17	10	29.0	March	25	3	12.4	March	3	14	43.9
April	9	4	16.8	April	15	20	55.7	April	23	20	14.4	April	2	7	39.3
May	8	12	24.6	May	15	9	4.8	May	23	12	30.8	May	1	20	21.3
June	6	20	8.1	June	13	23	11.1	June	22	3	3.6	May	31	5	16.2
July	6	4	11.7	July	13	15	16.1	July	21	15	28.7	June	29	11	30.6
August	4	13	28.5	August	12	8	52.8	August	20	2	5.8	July	28	16	26.2
September	3	0	57.4	September	11	3	2.3	September	18	11	44.0	August	26	21	24.9
October	2	15	23.7	October	10	20	31.7	October	17	21	16.1	September	25	3	45.4
November	1	8	47.8	November	9	12	21.1	November	16	7	16.7	October	24	12	39.6
December	1	4	2.4	December	9	1	57.1	December	15	17	56.8	November	23	1	5.1
December	30	23	12.9									December	22	17	27.3

## APOGEE, PERIGEE, AND GREATEST LIBRATION.

Apogee.		Perigee.		Greatest Libration.			
	d h		d h		d h		d h
January	3 13.3	January	16 20.4	January	9 22.7 E.	January	24 17.4 W.
January	31 10.6	February	12 4.9	February	6 10.5 E.	February	19 20.9 W.
February	28 5.5	March	12 6.1	March	6 11.2 E.	March	18 20.9 W.
March	27 18.1	April	9 15.6	April	3 16.7 E.	April	15 20.1 W.
April	23 21.1	May	8 2.3	May	1 21.7 E.	May	14 1.5 W.
May	21 1.5	June	5 10.5	May	29 19.7 E.	June	11 6.2 W.
June	17 14.0	July	3 10.0	June	25 22.4 E.	July	9 5.6 W.
July	15 6.9	July	30 5.3	July	22 5.3 E.	August	5 18.4 W.
August	12 1.5	August	24 8.1	August	18 5.2 E.	September	1 11.6 W.
September	8 20.7	September	20 17.3	September	14 22.5 E.	September	27 19.9 W.
October	6 14.1	October	18 22.1	October	13 1.7 E.	October	25 7.6 W.
November	3 1.1	November	16 9.7	November	10 9.2 E.	November	22 11.0 W.
November	30 1.9	December	14 22.6	December	8 15.3 E.	December	20 18.9 W.
December	27 9.2						

## FORMULÆ FOR THE LIBRATION OF THE MOON.

Let  $I$  = the inclination of the Moon's equator to the ecliptic ( $= 1^\circ 28' 8''$ ).

$\Omega$  = the mean longitude of the Moon's ascending node, or the mean longitude of the descending node of the Moon's equator,

$C$  = the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,

$\lambda, \beta, a, \delta$  = the apparent longitude, latitude, right ascension, and declination of the Moon, corrected for parallax,

$\lambda'$  = the selenocentric longitude of the Earth, counted on the Moon's equator from its descending node,  $\Omega$ .

$i, \Delta, \Omega', \zeta$  = the quantities defined on page 284, where their values for the current year are given.

The Moon's libration in longitude and latitude may then be found, for any time, by means of the following formulæ, in connection with the tables given on pages 284 and 285:

$$\left. \begin{aligned} \mu &= -0'.574 \sin 2(\Omega - \lambda) \\ A &= \sin I \cos (\Omega - \lambda) \\ \tan B &= \tan I \sin (\Omega - \lambda) \\ \lambda' &= \lambda + \mu + Ab \end{aligned} \right\} \text{ See table, page 285.}$$

$$\begin{aligned} \text{The libration in latitude} &= b = B - \beta \\ \text{The libration in longitude} &= l = \lambda' - \zeta \\ \sin C &= \sin i \frac{\cos (\lambda' + \Delta - \Omega)}{\cos \delta} = -\sin i \frac{\cos (a - \Omega')}{\cos \delta} \end{aligned}$$

MEAN PLACES FOR 1910.0. (January 0<sup>d</sup>.521, Washington.)

Name of Star.		Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.	Annual Proper Motion.
			h	m	s	s	° ' "	"
4	Ceti	6.3	0	3	7.474	+ 0.0018	— 3 2 58.71	+ 0.009
5	Ceti	6.3	0	3	35.587	+ 0.0003	2 56 53.86	+ 0.014
24	B. Ceti	6.0	0	5	42.407	+ 0.0020	5 44 54.32	0.000
54	B. Ceti	6.3	0	19	53.719	— 0.0024	2 43 0.92	— 0.051
10	Ceti	6.4	0	22	0.482	+ 0.0056	0 32 52.09	+ 0.011
14	Ceti	5.4	0	30	55.582	+ 0.0098	— 0 59 59.82	— 0.059
155	B. Piscium	6.5	0	46	40.178	+ 0.0011	+ 2 53 48.02	— 0.094
26	Ceti	6.0	0	59	11.072	+ 0.0081	0 53 4.81	— 0.037
77	Piscium	6.4	1	1	9.749	+ 0.0011	4 25 45.84	— 0.114
33	Ceti	6.1	1	5	55.598	— 0.0010	1 58 0.94	— 0.006
263	B. Piscium	6.4	1	23	39.388	+ 0.0027	+ 7 29 42.96	+ 0.008
μ	Piscium	5.0	1	25	28.091	+ 0.0199	5 40 49.57	— 0.027
ε	Arietis	5.5	2	19	59.438	+ 0.0006	10 12 12.07	— 0.022
29	Arietis	6.1	2	27	58.220	— 0.0013	14 38 11.07	+ 0.034
31	Arietis	5.7	2	31	43.299	+ 0.0189	12 3 28.01	— 0.085
0	Arietis	5.8	2	39	35.254	— 0.0002	+ 14 55 51.70	— 0.026
38	Arietis	5.2	2	40	3.201	+ 0.0081	12 4 3.16	— 0.079
124	B. Arietis	6.4	2	48	10.648	+ 0.0012	16 6 59.39	— 0.053
145	B. Arietis	6.5	2	59	39.974	— 0.0021	15 30 24.56	— 0.141
53	Arietis	6.0	3	2	21.486	— 0.0019	17 31 59.01	+ 0.004
54	Arietis	6.5	3	3	14.826	+ 0.0018	+ 18 27 0.53	— 0.014
175	B. Arietis	6.4	3	21	54.813	+ 0.0026	18 26 30.43	— 0.011
26	B. Tauri	6.4	3	29	0.593	+ 0.0060	17 32 17.05	— 0.322
14	H' Tauri	6.5	3	33	46.543	...	20 37 22.76	...
13	Tauri	5.6	3	37	7.373	+ 0.0003	19 24 45.10	— 0.019
14	Tauri	6.2	3	38	34.832	+ 0.0084	+ 19 22 51.92	— 0.049
22	H' Tauri	6.1	3	39	13.802	+ 0.0008	20 38 42.20	— 0.006
133	B. Tauri	5.9	3	44	37.532	+ 0.0026	21 58 15.28	— 0.042
32	Tauri	5.8	3	51	32.817	+ 0.0045	22 13 9.64	— 0.112
39	Tauri	6.1	4	0	0.433	+ 0.0125	21 45 59.94	— 0.131
43	Tauri	5.5	4	3	55.256	+ 0.0079	+ 19 22 18.37	— 0.044
192	B. Tauri	6.1	4	7	30.844	— 0.0016	22 10 57.55	— 0.019
ω	Tauri	4.8	4	11	59.130	— 0.0022	20 21 28.00	— 0.055
51	Tauri	5.6	4	13	3.506	+ 0.0071	21 21 35.67	— 0.041
53	Tauri	5.3	4	14	7.729	+ 0.0028	20 55 30.77	— 0.051
56	Tauri	5.2	4	14	16.917	+ 0.0032	+ 21 33 24.15	— 0.040
224	B. Tauri	6.1	4	17	4.067	— 0.0002	20 36 33.34	— 0.001
227	B. Tauri	5.9	4	18	14.061	+ 0.0019	20 46 22.34	— 0.031
62	Tauri	6.1	4	18	34.066	+ 0.0008	24 5 30.94	— 0.019
κ	Tauri	4.1	4	20	0.165	+ 0.0062	22 5 18.99	— 0.042
67	Tauri	5.4	4	20	3.287	+ 0.0093	+ 21 59 41.32	— 0.047
v	Tauri	4.2	4	20	55.209	+ 0.0079	22 36 36.37	— 0.047
72	Tauri	5.4	4	21	54.407	+ 0.0004	22 47 39.06	— 0.008
247	B. Tauri	5.8	4	22	40.145	+ 0.0073	21 25 10.29	— 0.076
284	B. Tauri	6.0	4	31	3.892	+ 0.0109	23 9 27.07	— 0.102
95	Tauri	6.2	4	37	46.722	+ 0.0014	+ 23 55 8.18	— 0.030
300	B. Tauri	6.2	4	40	16.356	+ 0.0005	23 27 48.69	+ 0.004
315	B. Tauri	6.3	4	50	46.635	— 0.0001	24 26 56.50	— 0.033
99	Tauri	6.0	4	52	20.919	+ 0.0003	23 48 30.89	— 0.035
k	Tauri	5.6	4	52	38.846	+ 0.0023	24 54 43.21	— 0.061
103	Tauri	5.5	5	2	37.502	+ 0.0003	+ 24 8 48.45	— 0.022
118	Tauri	5.4	5	23	44.131	+ 0.0016	25 4 41.66	— 0.038
121	Tauri	5.1	5	29	57.260	+ 0.0010	23 58 49.42	— 0.031
112	B. Aurigæ	5.7	5	31	31.507	— 0.0004	26 52 7.18	— 0.040
125	Tauri	5.1	5	34	9.528	+ 0.0018	25 50 50.33	— 0.029
132	Tauri	5.0	5	43	29.538	0.0000	+ 24 32 16.99	— 0.023

MEAN PLACES FOR 1910.0. (January 0<sup>d</sup>.521, Washington.)

Name of Star.		Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
			h	m	s	s	°	'	"	"
136	Tauri . . . . .	4.6	5	47	40.254	+ 0.0013	+ 27	35	30.01	- 0.020
412	B. Tauri . . . . .	5.8	5	51	25.437	....	24	14	13.79	...
139	Tauri . . . . .	4.7	5	52	24.584	0.0000	25	56	36.46	- 0.007
415	B. Tauri . . . . .	6.1	5	55	21.196	+ 0.0018	27	34	6.00	- 0.001
5	Geminorum . . . . .	5.9	6	6	1.175	+ 0.0011	24	26	26.68	- 0.061
49	Aurigæ . . . . .	5.1	6	29	32.014	- 0.0001	+ 28	5	35.28	- 0.027
52	B. Geminorum . . . . .	6.5	6	31	56.226	- 0.0021	24	39	58.14	- 0.002
54	Aurigæ . . . . .	5.8	6	33	52.618	- 0.0012	28	20	35.79	- 0.025
37	Geminorum . . . . .	5.7	6	49	46.643	- 0.0028	25	29	20.33	+ 0.014
39	Geminorum . . . . .	6.2	6	53	14.683	- 0.0117	26	11	59.90	+ 0.086
40	Geminorum . . . . .	6.3	6	53	54.564	- 0.0012	+ 26	2	13.24	- 0.015
47	Geminorum . . . . .	5.6	7	5	48.257	- 0.0011	27	0	18.28	- 0.051
52	Geminorum . . . . .	6.1	7	9	11.789	+ 0.0038	25	2	31.54	- 0.086
53	Geminorum . . . . .	5.9	7	10	20.015	- 0.0008	28	3	16.87	- 0.002
134	B. Geminorum . . . . .	6.5	7	11	28.989	+ 0.0058	26	51	8.20	- 0.134
Δ	Geminorum . . . . .	5.1	7	17	59.372	- 0.0051	+ 25	13	27.07	- 0.014
59	Geminorum . . . . .	5.7	7	18	57.544	+ 0.0010	27	48	45.31	+ 0.019
ι	Geminorum . . . . .	3.8	7	20	8.325	- 0.0086	27	58	39.62	- 0.088
ν	Geminorum . . . . .	4.3	7	30	22.731	- 0.0016	27	5	47.20	- 0.109
176	B. Geminorum . . . . .	6.3	7	32	47.775	+ 0.0038	24	33	44.60	- 0.029
181	B. Geminorum . . . . .	6.0	7	33	45.835	- 0.0006	+ 24	25	37.03	- 0.029
κ	Geminorum . . . . .	5.5	7	38	37.622	- 0.0017	25	59	55.70	- 0.028
κ	Geminorum . . . . .	3.6	7	39	0.988	- 0.0014	24	36	51.99	- 0.060
5	B. Cancri . . . . .	6.4	7	55	38.485	- 0.0003	23	49	51.62	- 0.047
4	Cancri . . . . .	6.2	7	56	18.208	- 0.0012	25	20	16.17	+ 0.007
ψ	Cancri . . . . .	5.9	8	5	2.060	- 0.0055	+ 25	46	52.08	- 0.351
35	B. Cancri . . . . .	6.4	8	8	21.889	- 0.0017	23	24	32.68	- 0.022
λ	Cancri . . . . .	5.9	8	15	11.212	- 0.0011	24	18	22.72	- 0.028
28	Cancri . . . . .	6.1	8	23	16.747	- 0.0023	24	26	38.62	- 0.072
ν <sup>α</sup>	Cancri . . . . .	5.7	8	26	11.374	- 0.0056	24	23	6.36	- 0.069
ν <sup>β</sup>	Cancri . . . . .	6.4	8	27	41.046	- 0.0047	+ 24	23	29.15	- 0.068
194	B. Cancri . . . . .	6.3	9	2	15.847	- 0.0122	23	20	34.11	+ 0.015
ξ	Cancri . . . . .	5.2	9	4	11.260	+ 0.0011	22	24	36.11	+ 0.002
79	Cancri . . . . .	6.1	9	5	10.780	+ 0.0003	22	21	44.31	- 0.005
90	H' Cancri . . . . .	6.1	9	8	29.001	- 0.0007	21	39	16.01	- 0.013
57	B. Leonis . . . . .	6.5	9	39	29.904	+ 0.0020	+ 19	16	39.65	- 0.077
η	Leonis . . . . .	3.6	10	2	25.586	- 0.0022	17	12	6.89	- 0.004
42	Leonis . . . . .	6.1	10	17	0.047	- 0.0017	15	25	46.41	- 0.027
46	Leonis . . . . .	5.8	10	27	23.632	- 0.0024	14	35	58.19	+ 0.022
κ	Leonis . . . . .	5.5	10	41	39.383	- 0.0089	14	40	12.53	- 0.064
ι	Leonis . . . . .	4.1	11	19	13.991	+ 0.0103	+ 11	1	30.37	- 0.083
ω	Virginis . . . . .	5.4	11	33	49.206	- 0.0005	8	37	56.64	- 0.012
ξ	Virginis . . . . .	4.8	11	40	38.756	+ 0.0045	8	45	30.38	- 0.034
ν	Virginis . . . . .	4.2	11	41	14.044	- 0.0014	7	2	1.69	- 0.186
δ	Virginis . . . . .	5.2	11	55	20.366	- 0.0008	4	9	23.54	- 0.012
36	B. Virginis . . . . .	6.5	11	59	8.877	- 0.0095	+ 6	3	39.84	- 0.076
10	Virginis . . . . .	6.2	12	5	4.625	+ 0.0034	2	24	11.86	- 0.181
κ	Virginis . . . . .	5.1	12	15	46.714	- 0.0198	3	48	49.42	- 0.072
250	B. Virginis . . . . .	5.9	12	33	47.003	- 0.0042	+ 2	21	0.07	- 0.021
38	Virginis . . . . .	6.1	12	48	34.614	- 0.0173	- 3	3	50.75	- 0.004
κ	Virginis . . . . .	5.7	12	55	1.288	- 0.0027	- 3	19	35.97	- 0.004
46	Virginis . . . . .	6.1	12	55	57.787	- 0.0026	2	53	4.82	+ 0.046
48	Virginis . . . . .	6.5	12	59	16.109	- 0.0033	3	10	44.38	- 0.028
65	Virginis . . . . .	6.0	13	18	38.985	- 0.0016	4	27	13.72	- 0.016
66	Virginis . . . . .	5.7	13	19	52.038	+ 0.0105	4	41	37.90	- 0.030
72	Virginis . . . . .	6.1	13	25	43.892	+ 0.0023	- 6	0	21.33	+ 0.014

MEAN PLACES FOR 1910.0. (January 0 <sup>d</sup> .521, Washington.)						
Name of Star.		Magni- tude.	Right Ascension.			Declination.
			h	m	s	° ' "
/	Virginis	4.8	13	27	17.059	— 5 47 28.78
80	Virginis	5.6	13	30	50.271	4 56 16.63
575	B. Virginis	6.2	13	42	27.959	9 15 31.23
88	Virginis	6.5	13	43	35.369	6 23 19.00
598	B. Virginis	6.1	13	50	14.839	7 36 58.62
623	B. Virginis	6.5	13	59	35.442	— 8 49 31.56
95	Virginis	5.4	14	1	57.105	8 53 3.36
96	Virginis	6.5	14	4	12.770	9 54 30.66
2	Librae	6.3	14	18	34.914	11 18 12.05
4	G. Librae	6.5	14	19	50.523	11 15 40.73
6	B. Librae	6.2	14	32	12.412	— 11 55 22.47
22	B. Librae	6.4	14	43	0.146	12 27 41.02
μ	Librae	5.4	14	44	22.902	13 46 28.13
8	Librae	5.4	14	45	42.370	15 37 24.39
ν	Librae	5.3	15	1	36.215	15 54 30.21
22	Librae	6.5	15	1	47.467	— 16 8 10.85
26	Librae	6.3	15	9	28.864	17 25 57.97
28	Librae	6.2	15	15	47.328	17 49 55.63
32	Librae	5.9	15	23	10.704	16 24 11.79
147	B. Librae	6.2	15	25	24.047	20 25 9.32
34	Librae	6.0	15	25	35.609	— 16 18 3.93
150	B. Librae	6.1	15	26	32.527	19 51 26.64
11	H. Librae	5.4	15	27	26.401	19 21 51.55
ζ	Librae	5.6	15	27	49.999	16 32 53.99
172	B. Librae	5.9	15	33	2.058	20 43 7.98
41	Librae	5.3	15	33	43.597	— 19 0 20.75
κ	Librae	5.0	15	36	45.496	19 23 14.71
λ	Librae	4.9	15	48	6.411	19 53 55.43
47	Librae	5.8	15	49	48.182	19 7 3.58
10	G. Scorpii	5.9	15	52	24.820	20 43 21.22
56	B. Scorpii	5.0	16	0	12.525	— 19 33 21.29
ω <sup>1</sup>	Scorpii	4.3	16	1	32.380	20 25 33.99
ω <sup>2</sup>	Scorpii	4.6	16	2	7.515	20 37 34.71
84	B. Scorpii	6.3	16	9	11.256	20 52 45.56
51	G. Scorpii	6.5	16	11	40.453	21 4 49.77
58	G. Scorpii	6.2	16	13	51.366	— 19 59 55.82
19	Scorpii	4.9	16	15	13.078	23 57 10.42
ρ	Ophiuchi	4.7	16	20	11.119	23 14 23.65
ω	Ophiuchi	4.5	16	26	47.980	21 16 27.84
126	B. Scorpii	6.1	16	36	8.821	24 17 38.28
24	Ophiuchi	5.5	16	51	22.287	— 23 0 29.42
88	B. Ophiuchi	6.3	16	54	27.002	24 57 21.90
26	Ophiuchi	5.8	16	54	38.624	24 51 8.23
118	B. Ophiuchi	6.2	17	1	18.506	26 23 30.98
137	B. Ophiuchi	6.3	17	6	42.114	25 8 40.20
36	Ophiuchi (1st star)	5.4	17	9	48.648	— 26 28 17.30
39	Ophiuchi	5.1	17	12	31.263	24 11 22.20
191	B. Ophiuchi	6.3	17	19	36.086	24 9 42.83
136	G. Ophiuchi	6.3	17	21	21.087	25 51 51.66
51	Ophiuchi	4.8	17	25	55.414	23 53 37.23
151	G. Ophiuchi	6.0	17	26	9.079	— 26 12 4.53
4	G. Sagittarii	6.2	17	42	50.115	26 56 36.96
63	Ophiuchi	6.1	17	49	21.756	24 52 11.48
66	B. Sagittarii	4.7	18	12	25.180	27 4 32.16
67	B. Sagittarii	6.4	18	13	7.407	— 25 38 20.68

MEAN PLACES FOR 1910.0. (January 0<sup>d</sup>.521, Washington.)

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ' "	"
70 B. Sagittarii . . . . .	6.4	18 15 58.982	+ 0.0014	— 24 57 22.85	— 0.001
68 G. Sagittarii . . . . .	6.2	18 22 7.116	0.0000	26 41 19.09	— 0.046
69 G. Sagittarii . . . . .	6.3	18 22 29.331	+ 0.0018	26 48 41.83	— 0.032
86 B. Sagittarii . . . . .	6.5	18 23 20.614	— 0.0063	26 38 22.42	— 0.054
126 B. Sagittarii . . . . .	5.7	18 39 17.628	— 0.0008	25 6 7.43	— 0.041
φ Sagittarii . . . . .	3.3	18 40 2.023	+ 0.0034	— 27 5 2.27	— 0.006
162 B. Sagittarii . . . . .	6.4	18 52 49.455	— 0.0009	24 59 50.68	— 0.020
127 G. Sagittarii . . . . .	6.4	18 54 53.464	+ 0.0023	25 4 4.29	+ 0.051
172 B. Sagittarii . . . . .	5.8	18 56 57.321	+ 0.0002	24 58 17.28	— 0.172
τ Sagittarii . . . . .	3.5	19 1 19.340	— 0.0046	27 48 9.60	— 0.254
189 B. Sagittarii . . . . .	6.1	19 2 44.696	+ 0.0012	— 24 47 54.43	+ 0.001
201 B. Sagittarii . . . . .	5.9	19 7 41.124	— 0.0015	26 3 30.15	— 0.018
ψ Sagittarii . . . . .	4.8	19 10 1.367	+ 0.0025	25 24 45.04	— 0.035
χ Sagittarii . . . . .	4.9	19 19 47.967	+ 0.0033	24 41 2.16	— 0.063
248 B. Sagittarii . . . . .	5.7	19 24 18.252	+ 0.0017	27 10 12.35	— 0.014
51 Sagittarii . . . . .	5.8	19 30 33.879	+ 0.0004	— 24 54 59.91	— 0.005
λ Sagittarii . . . . .	4.7	19 31 13.886	+ 0.0044	25 4 58.52	— 0.027
308 B. Sagittarii . . . . .	6.3	19 48 54.499	— 0.0094	24 9 56.10	— 0.438
ω Sagittarii . . . . .	4.8	19 50 19.683	+ 0.0145	26 32 19.70	+ 0.080
♌ Sagittarii . . . . .	4.9	19 53 28.262	+ 0.0013	26 26 22.98	+ 0.036
36 B. Capricorni . . . . .	6.2	20 24 14.600	+ 0.0003	— 22 41 25.73	— 0.027
40 B. Capricorni . . . . .	6.2	20 27 30.980	+ 0.0003	25 14 54.48	— 0.064
56 B. Capricorni . . . . .	6.3	20 34 50.571	+ 0.0376	24 6 11.94	+ 0.462
17 Capricorni . . . . .	5.8	20 40 57.045	+ 0.0011	21 50 29.88	— 0.014
86 B. Capricorni . . . . .	6.2	20 47 44.628	+ 0.0071	24 7 14.67	— 0.048
χ Capricorni . . . . .	5.3	21 3 24.444	+ 0.0013	— 21 33 20.47	— 0.059
27 Capricorni . . . . .	6.1	21 4 24.390	+ 0.0085	20 55 5.63	— 0.123
φ Capricorni . . . . .	5.3	21 10 30.634	0.0000	21 1 32.49	0.000
33 Capricorni . . . . .	5.3	21 19 3.453	— 0.0013	21 14 5.08	— 0.112
35 Capricorni . . . . .	6.0	21 22 8.804	— 0.0016	21 35 11.57	— 0.030
128 B. Capricorni . . . . .	6.5	21 24 56.619	+ 0.0019	— 19 32 26.81	— 0.027
37 Capricorni . . . . .	5.7	21 29 47.975	— 0.0016	20 29 9.41	+ 0.025
ε Capricorni . . . . .	4.7	21 32 2.576	0.0000	19 52 11.04	0.000
κ Capricorni . . . . .	4.8	21 37 38.058	+ 0.0094	19 16 36.80	— 0.006
143 B. Capricorni . . . . .	6.1	21 38 11.636	+ 0.0067	20 1 56.31	— 0.039
154 B. Capricorni . . . . .	6.1	21 46 42.036	+ 0.0103	— 19 2 33.79	— 0.076
161 B. Capricorni . . . . .	6.4	21 57 14.661	+ 0.0060	18 20 9.71	— 0.090
29 Aquarii ( <i>mean</i> ) . . . . .	6.5	21 57 31.098	+ 0.0008	17 23 54.65	+ 0.009
145 G. Aquarii . . . . .	6.5	22 1 41.034	+ 0.0180	17 11 55.26	+ 0.015
f Aquarii . . . . .	6.3	22 21 41.424	+ 0.0154	17 12 0.83	— 0.008
56 Aquarii . . . . .	6.1	22 25 28.062	+ 0.0022	— 15 2 45.63	— 0.034
69 Aquarii . . . . .	5.6	22 42 56.144	+ 0.0024	14 31 51.96	— 0.014
τ Aquarii . . . . .	4.4	22 44 49.702	— 0.0008	14 4 4.07	— 0.033
74 Aquarii . . . . .	5.8	22 48 44.467	+ 0.0013	12 5 43.18	0.000
257 B. Aquarii . . . . .	6.3	22 54 51.354	— 0.0026	13 33 10.95	+ 0.034
290 B. Aquarii . . . . .	6.3	23 9 58.827	.....	— 11 10 40.01	.....
ψ <sup>1</sup> Aquarii . . . . .	4.5	23 11 10.652	+ 0.0250	9 34 41.12	— 0.005
ψ <sup>2</sup> Aquarii . . . . .	4.6	23 13 13.618	+ 0.0012	9 40 25.95	— 0.002
ψ <sup>3</sup> Aquarii . . . . .	5.2	23 14 16.848	+ 0.0027	10 6 10.69	— 0.001
336 B. Aquarii . . . . .	6.3	23 24 21.502	.....	9 45 40.26	.....
351 B. Aquarii . . . . .	6.5	23 30 53.537	— 0.0005	— 7 57 45.56	+ 0.018
376 B. Aquarii . . . . .	6.3	23 43 55.047	— 0.0009	6 52 48.93	— 0.023
27 Piscium . . . . .	5.1	23 54 3.934	— 0.0034	4 3 18.88	— 0.066
29 Piscium . . . . .	5.1	23 57 12.695	+ 0.0009	3 31 42.46	— 0.012
30 Piscium . . . . .	4.7	23 57 20.673	+ 0.0030	— 6 30 51.25	— 0.037

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.											
JANUARY.											
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	$\gamma$	$x'$	$y'$	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
$\omega$ Virginis	5.4	-0.50	+ 1.9	+ 8 38.0	1 0 56.0	+ 8 4.3	-0.3242	0.5012	-0.2297	+25	-58
$\xi$ Virginis	4.8	0.53	1.7	8 45.5	4 38.1	+11 40.2	-1.3170	0.4996	0.2315	-41	-81
$\nu$ Virginis	4.2	0.54	2.3	7 2.1	4 57.3	+11 58.8	+0.5004	0.4995	0.2316	+72	-14
36 B. Virginis	6.5	0.64	2.2	6 3.7	14 46.8	- 2 28.0	-0.7256	0.4958	0.2353	+ 4	-84
c Virginis	5.1	0.73	2.7	3 48.9	2 0 0.7	+ 6 30.7	-0.4349	0.4932	0.2374	+19	-67
250 B. Virginis	5.9	-0.83	+ 2.8	+ 2 21.0	10 5.5	- 7 40.8	-1.2213	0.4914	-0.2385	-30	-88
65 Virginis	6.0	1.11	4.1	- 4 27.2	3 11 20.1	- 7 6.8	+0.3003	0.4916	0.2356	+58	-26
66 Virginis	5.7	1.12	4.2	4 41.6	12 1.1	- 6 26.9	+0.4052	0.4917	0.2354	+65	-21
72 Virginis	6.1	1.16	4.4	6 0.3	15 18.3	- 3 15.1	+1.0852	0.4922	0.2343	+84	+19
l Virginis	4.8	1.16	4.3	5 47.4	16 10.5	- 2 24.3	-0.6442	0.4923	0.2341	+82	- 8
80 Virginis	5.6	-1.18	+ 3.9	- 4 56.2	18 9.7	- 0 28.3	-0.7644	0.4928	-0.2333	+ 1	-90
88 Virginis	6.5	1.25	4.0	6 23.2	4 1 15.7	+ 6 26.0	-0.8061	0.4945	0.2304	- 2	-90
598 B. Virginis	6.1	1.30	4.3	7 36.9	4 56.8	+10 1.1	-0.2944	0.4957	0.2287	+25	-59
623 B. Virginis	6.5	1.35	4.4	8 49.5	10 5.5	- 8 58.7	-0.1271	0.4974	0.2259	+33	-49
95 Virginis	5.4	1.37	4.4	8 53.0	11 23.2	- 7 43.1	-0.3539	0.4979	0.2251	+21	-62
96 Virginis	6.5	-1.39	+ 4.6	- 9 54.4	12 37.4	- 6 31.0	+0.4998	0.4984	-0.2244	+69	-16
$\kappa$ Virginis	4.2	1.40	4.5	9 51.2	14 44.5	- 4 27.5	-0.0330	0.4992	0.2230	+37	-44
2 Libræ	6.3	1.47	4.6	11 18.1	20 25.9	+ 1 4.4	+0.3077	0.5016	0.2192	+56	-25
4 G. Libræ	6.5	1.48	4.5	11 15.6	21 6.7	+ 1 44.1	+0.1124	0.5019	0.2187	+44	-36
6 B. Libræ	6.2	1.55	4.3	11 55.3	5 3 44.3	+ 8 10.3	-0.5896	0.5052	0.2134	+ 7	-80
22 B. Libræ	6.4	-1.60	+ 4.0	-12 27.6	9 27.2	-10 16.6	-1.2011	0.5083	-0.2084	-34	-90
$\mu$ Libræ	5.4	1.62	4.4	13 46.4	10 10.7	- 9 34.4	+0.0933	0.5088	0.2078	+42	-36
$\nu$ Libræ	5.3	1.73	4.3	15 54.4	19 8.3	- 0 52.6	+0.6167	0.5141	0.1987	+71	- 9
22 Libræ	6.5	1.73	4.4	16 8.1	19 14.1	- 0 46.9	+0.8478	0.5142	0.1986	+74	+ 5
28 Libræ	6.2	1.82	4.2	17 49.9	6 2 22.7	+ 6 8.9	+1.3157	0.5188	0.1904	+72	+48
32 Libræ	5.9	-1.83	+ 3.5	-16 24.1	6 5.9	+ 9 45.4	-0.9488	0.5214	-0.1858	-18	-90
34 Libræ	6.0	1.85	3.4	16 18.0	7 18.4	+10 55.6	-1.2837	0.5222	0.1843	-48	-90
$\zeta$ Libræ	5.6	1.86	3.3	16 32.8	8 25.4	-11 59.4	-1.2178	0.5230	0.1828	-40	-90
41 Libræ	5.3	1.92	3.7	19 0.3	11 20.8	- 9 9.4	+0.9396	0.5251	0.1788	+71	+12
$\kappa$ Libræ	5.0	1.93	3.7	19 23.2	12 50.5	- 7 42.5	+1.0901	0.5262	0.1768	+71	+23
$\lambda$ Libræ	4.9	-1.99	+ 3.2	-19 53.9	18 23.2	- 2 20.3	+0.6880	0.5303	-0.1688	+70	- 4
47 Libræ	5.8	1.98	2.9	19 7.0	19 12.5	- 1 32.5	-0.3012	0.5309	0.1675	+16	-60
10 G. Scorpïi	5.9	2.02	3.2	20 43.3	20 28.2	- 0 19.2	+1.2365	0.5319	0.1656	+69	-38
$\beta^1$ Scorpïi	2.9	2.03	2.5	19 33.5	7 0 12.4	+ 3 17.7	-0.6369	0.5347	0.1597	- 3	-87
56 B. Scorpïi	5.0	2.03	2.5	19 33.3	0 12.6	+ 3 17.9	-0.6415	0.5347	0.1597	- 3	-87
$\omega^1$ Scorpïi	4.3	-2.05	+ 2.7	-20 25.5	0 50.7	+ 3 54.8	+0.2035	0.5352	-0.1587	+41	-30
$\omega^2$ Scorpïi	4.6	2.05	2.7	20 37.5	1 7.4	+ 4 11.0	+0.3770	0.5354	0.1582	+51	-21
84 B. Scorpïi	6.3	2.08	2.4	20 52.7	4 28.2	+ 7 25.2	+0.1312	0.5379	0.1526	+36	-34
51 G. Scorpïi	6.5	2.09	2.3	21 4.8	5 38.5	+ 8 33.3	-0.1720	0.5388	0.1507	+38	-32
58 G. Scorpïi	6.2	2.08	2.0	19 59.9	6 40.0	+ 9 32.8	-1.1546	0.5396	0.1488	-39	-90
$\omega$ Ophiuchi	4.5	-2.15	+ 1.5	-21 16.4	12 41.1	- 8 38.1	-0.6346	0.5442	-0.1381	- 5	-88
24 Ophiuchi	5.5	2.25	+ 0.5	23 0.5	23 51.0	+ 2 9.1	-0.1830	0.5526	0.1162	+16	-53
39 Ophiuchi	5.1	2.33	- 0.5	24 11.4	8 9 12.5	+11 11.0	+0.0918	0.5593	0.0961	+28	-36
$\theta$ Ophiuchi	3.3	2.35	0.6	24 54.6	10 56.3	-11 8.8	+0.7014	0.5605	0.0922	+64	- 2
191 B. Ophiuchi	6.3	2.34	0.9	24 9.7	12 17.7	- 9 50.4	-0.2235	0.5613	0.0892	+11	-55
b Ophiuchi(var.)	4.4	-2.34	- 1.0	-24 5.6	12 50.8	- 9 18.4	-0.3456	0.5617	-0.0879	+ 4	-64
51 Ophiuchi	4.8	2.35	1.4	23 53.6	15 2.0	- 7 11.9	-0.7452	0.5632	-0.0828	-18	-90
NEW MOON.											
37 Capricorni	5.7	2.01	12.8	20 29.4	12 19 49.0	- 6 12.3	+0.5536	0.5677	+0.1722	+62	-11
$\epsilon$ Capricorni	4.7	-1.99	-12.8	-19 52.4	20 46.2	- 5 17.2	+0.0864	0.5672	+0.1741	+35	-37
$\kappa$ Capricorni	4.8	1.97	12.8	19 16.8	23 9.2	- 2 59.4	-0.1010	0.5661	0.1788	+26	-47
143 B. Capricorni	6.1	1.97	13.0	20 2.2	23 23.5	- 2 45.7	+0.7163	0.5659	0.1793	+70	- 2
154 B. Capricorni	6.1	1.93	13.0	19 2.8	13 3 2.3	+ 0 45.3	+0.3683	0.5642	0.1862	+52	-22
161 B. Capricorni	6.4	1.88	13.1	18 20.4	7 35.3	+ 5 8.5	+0.5111	0.5619	0.1945	+62	-14
29 Aquarii(mean)	6.5	-1.87	-12.9	-17 24.1	7 42.4	+ 5 15.4	-0.4248	0.5619	+0.1948	+11	-68

ELEMENTS FOR THE PREDICTION OF OCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declination.	Washington Mean Time.			Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d	h	m						
56 . Aquarii	6.1	-1.74	-12.9	-15 3.0	13	19	56.8	- 6 56.1	-0.3172	0.5557	+0.2147	+19	-60
69 . Aquarii	5.6	1.65	12.9	14 32.1	14	3	43.6	+ 0 34.4	+0.8711	0.5520	0.2255	+75	+ 6
7 . Aquarii	4.4	1.64	12.8	14 4.3	4	34.5	+ 1 23.6	+0.5910	0.5516	0.2266	+71	-10	
74 . Aquarii	5.8	1.62	12.4	12 5.9	6	20.0	+ 3 5.4	-1.0170	0.5508	0.2288	-19	-90	
257 B. Aquarii	6.3	1.59	12.7	13 33.4	9	5.5	+ 5 45.3	+1.1027	0.5495	0.2322	+76	+22	
290 B. Aquarii	6.3	-1.52	-12.1	-11 10.9	15	57.8	-11 36.5	+0.3074	0.5467	+0.2395	+56	-25	
$\psi^1$ Aquarii	4.5	1.51	11.7	9 34.9	16	30.6	-11 4.8	-1.1877	0.5466	0.2401	-31	-90	
$\psi^2$ Aquarii	4.6	1.50	11.7	9 40.6	17	26.8	-10 10.4	-0.8648	0.5461	0.2411	- 7	-90	
$\psi^3$ Aquarii	5.2	1.49	11.8	10 6.4	17	55.8	- 9 42.5	-0.3122	0.5460	0.2415	+23	-60	
336 B. Aquarii	6.3	1.44	11.7	9 45.9	22	33.4	- 5 14.1	+0.4680	0.5442	0.2457	+67	-17	
351 B. Aquarii	6.5	-1.42	-11.2	- 7 57.9	15	1 34.3	- 2 19.2	-0.6142	0.5432	+0.2482	+ 8	-82	
376 B. Aquarii	6.3	1.35	10.8	6 53.0	7	36.6	+ 3 31.1	-0.2006	0.5414	0.2524	+30	-53	
30 . Piscium	4.7	1.28	10.5	6 31.0	13	52.4	+ 9 34.5	+1.0201	0.5398	0.2560	+83	+14	
33 . Piscium	4.7	1.26	10.4	6 12.8	15	27.4	+11 6.3	+1.1184	0.5394	0.2567	+84	+21	
24 B. Ceti	6.0	1.24	10.2	5 45.1	17	47.3	-10 38.4	+1.2490	0.5390	0.2577	+84	+32	
54 B. Ceti	6.3	-1.18	- 9.0	- 2 43.2	16	0 27.3	- 4 11.5	-0.0993	0.5379	+0.2598	+36	-47	
14 . Ceti	5.4	1.12	8.3	- 1 0.1	5	39.0	+ 0 50.0	-0.4868	0.5373	0.2608	+16	-71	
26 . Ceti	6.0	0.98	7.1	+ 0 53.0	18	58.3	-10 16.8	+1.0803	0.5373	0.2605	+90	+18	
33 . Ceti	6.1	0.95	6.6	1 57.9	22	8.8	- 7 12.5	-0.8096	0.5376	0.2598	+90	+ 1	
$f$ . Piscium	5.1	0.92	6.0	3 8.3	17	1 32.7	- 3 55.1	+0.5019	0.5380	0.2588	+72	-15	
$\mu$ . Piscium	5.0	-0.87	- 4.9	+ 5 40.7	7	19.3	+ 1 40.0	-0.5828	0.5389	+0.2565	+11	-77	
$\xi$ . Arietis	5.5	0.60	2.0	10 12.2	18	8 31.5	+ 2 1.8	+1.0923	0.5467	0.2378	+90	+23	
31 . Arietis	5.7	0.54	1.2	12 3.4	13	50.4	+ 7 9.9	+0.4592	0.5491	0.2319	+70	-14	
38 . Arietis	5.2	0.50	- 1.0	12 4.0	17	35.3	+10 47.1	+1.3103	0.5508	0.2274	+90	+46	
$\sigma$ . Arietis	5.5	0.48	+ 0.1	14 42.7	20	28.9	-10 25.3	-0.7224	0.5522	0.2237	+ 3	-75	
145 B. Arietis	6.5	-0.41	+ 0.5	+15 30.4	19	2 18.9	- 4 47.6	-0.2492	0.5552	+0.2155	+28	-49	
175 B. Arietis	6.4	0.30	1.9	18 26.5	12	2.9	+ 4 35.8	-1.2099	0.5605	0.2002	-34	-72	
26 B. Tauri	6.4	0.26	1.7	17 32.3	15	6.9	+ 7 33.2	+0.3156	0.5622	0.1948	+60	-17	
13 . Tauri	5.6	0.22	2.4	19 24.8	18	36.0	+10 54.8	-0.9252	0.5641	0.1887	-11	-71	
14 . Tauri	6.2	0.21	2.4	19 22.9	19	13.4	+11 30.8	+0.7759	0.5645	0.1875	- 1	-77	
43 . Tauri	5.5	-0.08	+ 2.7	+19 22.4	20	5 56.7	- 2 9.4	+1.1323	0.5705	+0.1662	+90	+36	
$\omega$ . Tauri	4.8	0.04	3.0	20 21.5	9	18.8	+ 1 5.1	+0.6741	0.5723	0.1590	+90	+ 6	
51 . Tauri	5.6	0.04	3.3	21 21.6	9	45.6	+ 1 30.9	-0.2784	0.5726	0.1580	+26	-44	
53 . Tauri	5.3	0.03	3.2	20 55.6	10	12.3	+ 1 56.7	+0.2357	0.5728	0.1570	+56	-17	
56 . Tauri	5.2	0.03	3.4	21 33.5	10	16.1	+ 2 0.3	-0.3992	0.5728	0.1570	+20	-51	
224 B. Tauri	6.1	-0.02	+ 3.2	+20 36.6	11	25.9	+ 3 7.5	+0.7494	0.5734	+0.1544	+90	+11	
227 B. Tauri	5.9	-0.01	3.2	20 46.4	11	54.5	+ 3 35.1	+0.6558	0.5737	0.1533	+90	+ 6	
$\kappa$ . Tauri	4.1	0.00	3.6	22 5.4	12	38.5	+ 4 17.4	-0.5766	0.5741	0.1517	+10	-61	
67 . Tauri	5.4	0.00	3.6	21 59.7	12	39.8	+ 4 18.6	-0.4775	0.5741	0.1516	+15	-55	
$\nu$ . Tauri	4.2	0.00	3.8	22 36.7	13	1.2	+ 4 39.2	-1.0520	0.5742	0.1508	-22	-67	
72 . Tauri	5.4	+0.01	+ 3.8	+22 47.7	13	25.7	+ 5 2.8	-1.1789	0.5744	+0.1499	-34	-67	
247 B. Tauri	5.8	0.01	3.4	21 25.2	13	44.6	+ 5 21.0	+0.2729	0.5746	0.1491	+58	-14	
284 B. Tauri	6.0	0.05	3.9	23 9.5	17	12.1	+ 8 40.6	-1.0017	0.5763	0.1412	-18	-67	
$\tau$ . Tauri	4.5	0.08	3.8	22 47.2	19	34.2	+10 57.4	-0.2932	0.5775	0.1357	+25	-42	
300 B. Tauri	6.2	0.10	4.0	23 27.9	20	58.3	-11 41.8	-0.7997	0.5782	0.1323	- 4	-67	
315 B. Tauri	6.3	+0.15	+ 4.3	+24 27.0	21	1 14.8	- 7 35.1	-1.2664	0.5801	+0.1218	-48	-66	
99 . Tauri	6.0	0.16	4.1	23 48.6	1	53.0	- 6 58.4	-0.5333	0.5805	0.1203	+12	-56	
103 . Tauri	5.5	0.21	4.2	24 8.9	6	2.2	- 2 58.7	-0.4026	0.5821	0.1097	+19	-46	
118 . Tauri	5.4	0.30	4.3	25 4.8	14	30.2	+ 5 9.6	-0.5234	0.5851	0.0876	+12	-52	
121 . Tauri	5.1	0.33	4.0	23 58.9	16	59.1	+ 7 32.6	+0.8140	0.5857	0.0809	+90	+22	
125 . Tauri	5.1	+0.35	+ 4.4	+25 50.9	18	39.5	+ 9 9.1	-0.9743	0.5861	+0.0763	-17	-64	
132 . Tauri	5.0	0.39	4.0	24 32.4	22	22.1	-11 17.0	+0.6372	0.5869	0.0662	+90	+14	
112 B. Tauri	5.8	0.42	3.9	24 14.3	22	1 30.8	- 8 15.7	+1.1423	0.5875	0.0574	+90	+48	
139 . Tauri	4.7	0.43	4.2	25 56.7	1	54.2	- 7 53.2	-0.5938	0.5875	0.0564	+ 8	-54	
5 . Geminorum	5.9	0.47	3.8	24 26.5	7	17.5	- 2 42.6	+1.2196	0.5882	0.0412	+90	+57	
52 B. Geminorum	6.5	+0.56	+ 3.5	+24 40.0	17	32.8	+ 7 8.5	+1.2638	0.5879	+0.0122	+90	+64	

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
$\epsilon$ Geminorum	3.2	+0.58	+3.4	+25 13.3	22 20 6.4	+ 9 36.0	+0.7124	0.5877	+0.0049	+90	+23
37 Geminorum	5.7	0.62	3.3	25 29.4	23 0 37.6	-10 3.5	+0.4286	0.5868	-0.0079	+70	+ 8
39 Geminorum	6.2	0.63	3.3	26 12.1	2 0 3	- 8 44.1	-0.3229	0.5866	0.0118	+23	-33
40 Geminorum	6.3	0.64	3.2	26 2.3	2 16.2	- 8 28.7	-0.1570	0.5865	0.0125	+33	-24
47 Geminorum	5.6	0.67	3.1	27 0.4	7 1.0	- 3 55.0	-1.2551	0.5853	0.0258	-52	-63
52 Geminorum	6.1	+0.67	+2.8	+25 2.6	8 22.5	- 2 36.7	+0.7497	0.5849	-0.0295	+90	+23
134 B. Geminorum	6.5	0.69	2.9	26 51.2	9 17.5	- 1 43.9	-1.1627	0.5846	0.0320	-36	-63
A Geminorum	5.1	0.69	2.6	25 13.5	11 54.3	+ 0 46.9	+0.4394	0.5836	0.0392	+71	+ 5
176 B. Geminorum	6.3	0.71	2.2	24 33.8	17 53.3	+ 6 32.0	+0.8481	0.5812	0.0554	+90	+27
181 B. Geminorum	6.0	0.71	2.2	24 25.7	18 16.8	+ 6 54.6	+0.9677	0.5810	0.0564	+90	+34
$\kappa$ Geminorum	5.5	+0.74	+2.2	+26 0.0	20 15.5	+ 8 48.8	-0.7914	0.5801	-0.0617	- 4	-64
C Geminorum	3.6	0.72	2.0	24 36.9	20 25.0	+ 8 58.0	-0.6458	0.5799	0.0621	+90	+14
$\omega^1$ Cancr	6.0	0.76	1.7	25 38.4	24 3 10.3	- 8 32.1	-0.9064	0.5765	0.0795	-12	-64
5 B. Cancr	6.4	0.74	1.6	23 49.9	3 14.1	- 8 28.5	+0.9843	0.5765	0.0797	+90	+33
4 Cancr	6.2	0.76	1.6	25 20.3	3 30.5	- 8 12.6	-0.6168	0.5762	0.0804	+ 7	-58
35 B. Cancr	6.4	+0.75	+1.2	+23 24.6	8 30.9	- 3 23.5	+0.9734	0.5732	-0.0928	+90	+31
$\lambda$ Cancr	5.9	0.76	1.0	24 18.4	11 22.2	- 0 38.5	-0.2441	0.5715	0.0997	+28	-36
28 Cancr	6.1	0.77	0.8	24 26.7	14 47.0	+ 2 38.7	-0.7437	0.5692	0.1077	- 1	-66
$\nu^1$ Cancr	5.7	0.77	0.7	24 23.1	16 1.0	+ 3 50.0	-0.8167	0.5683	0.1106	- 5	-66
$\iota^2$ Cancr	6.4	0.77	+0.7	24 23.5	16 39.1	+ 4 26.7	-0.8943	0.5678	0.1121	-10	-66
$\xi$ Cancr	5.2	+0.76	-0.4	+22 24.6	25 8 29.6	- 4 16.7	-0.8543	0.5562	-0.1458	- 7	-68
79 Cancr	6.1	0.76	0.4	22 21.7	8 56.0	- 3 51.2	-0.8681	0.5558	0.1467	- 8	-68
90 H' Cancr	6.1	0.75	0.5	21 39.3	10 24.2	- 2 26.1	-0.3348	0.5546	0.1495	+23	-47
57 B. Leonis	6.5	0.70	1.3	19 16.6	26 0 30.2	+11 11.2	-0.0928	0.5435	0.1743	+36	-36
$\eta$ Leonis	3.6	0.64	1.8	17 12.1	11 18.6	- 2 21.5	+0.1573	0.5350	0.1904	+51	-26
42 Leonis	6.1	+0.60	-2.0	+15 25.7	18 21.2	+ 4 27.6	+0.6893	0.5295	-0.1995	+90	+ 1
46 Leonis	5.8	0.57	2.1	14 35.9	23 27.8	+ 9 24.7	+0.5501	0.5258	0.2054	+77	- 7
$\iota$ Leonis	5.5	0.53	2.6	14 40.2	27 6 35.4	- 7 40.8	-1.0181	0.5208	0.2129	-16	-75
$\iota$ Leonis	4.1	0.39	2.9	11 1.5	28 1 59.4	+11 8.8	-1.3597	0.5088	0.2283	-49	-79
$\omega$ Virginis	5.4	0.32	2.7	8 37.9	9 44.7	- 5 19.2	-0.5396	0.5047	0.2326	+14	-72
$\nu$ Virginis	4.2	+0.29	-2.5	+ 7 2.0	13 43.8	- 1 26.8	+0.2770	0.5028	-0.2344	+57	-26
36 B. Virginis	6.5	0.21	2.8	6 3.6	23 28.0	+ 8 1.0	-0.9581	0.4989	0.2378	-10	-84
$\zeta$ Virginis	5.1	+0.12	2.5	+ 3 48.8	29 8 37.4	- 7 4.7	-0.6786	0.4961	0.2397	+ 6	-85
46 Virginis	6.1	-0.09	1.5	- 2 53.1	30 7 2.5	- 9 16.1	+1.3225	0.4923	0.2394	+87	+40
48 Virginis	6.5	0.11	1.4	3 10.8	8 53.6	- 7 28.0	+1.2045	0.4922	0.2391	+87	+28
65 Virginis	6.0	-0.21	-1.5	- 4 27.3	19 45.5	+ 3 6.3	+0.0309	0.4923	-0.2363	+43	-40
66 Virginis	5.7	0.22	1.4	4 41.7	20 26.4	+ 3 46.1	+0.1354	0.4925	0.2361	+49	-35
72 Virginis	6.1	0.26	1.1	6 0.4	23 43.2	+ 6 57.6	+0.8144	0.4928	0.2350	+84	+ 1
$\iota$ Virginis	4.8	0.26	1.2	5 47.5	31 0 35.2	+ 7 48.2	+0.3734	0.4928	0.2346	+63	-22
80 Virginis	5.6	0.27	1.6	4 56.3	2 34.3	+ 9 44.1	-1.0356	0.4932	0.2338	-16	-90
88 Virginis	6.5	-0.35	-1.4	- 6 23.3	9 40.2	- 7 21.6	-1.0786	0.4943	-0.2305	-20	-90
598 B. Virginis	6.1	0.39	1.2	7 37.0	13 21.5	+ 3 46.3	-0.5667	0.4952	0.2286	+11	-78
623 B. Virginis	6.5	0.44	1.0	8 49.5	18 30.7	+ 1 14.3	-0.3987	0.4966	0.2255	+19	-65
95 Virginis	5.4	0.46	1.0	8 53.1	19 48.6	+ 2 30.0	-0.6256	0.4970	0.2247	+ 7	-83
96 Virginis	6.5	0.48	0.7	9 54.5	21 3.0	+ 3 42.4	+0.2294	0.4973	0.2239	+52	-30
$\kappa$ Virginis	4.2	-0.50	-0.8	- 9 51.3	23 10.5	+ 5 46.3	-0.3037	0.4980	-0.2225	+24	-59

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2 Libræ	6.3	-0.56	-0.6	-11 18.2	1 4 53.1	+11 19.4	+0.0394	0.5000	-0.2183	+41	-40
4 G. Libræ	6.5	-0.57	-0.6	-11 15.7	5 34.1	+11 59.3	-0.1559	0.5003	-0.2178	+30	-51
6 B. Libræ	6.2	0.63	0.7	11 55.4	12 13.6	- 5 32.5	-0.8565	0.5031	0.2123	- 8	-90
$\mu$ Libræ	5.4	0.71	0.4	13 46.5	18 42.5	+ 0 45.3	-0.1683	0.5062	0.2063	+28	-51
$\nu$ Libræ	5.3	0.81	0.1	15 54.5	2 3 44.0	+ 9 31.0	+0.3635	0.5110	0.1970	+54	-22
22 Libræ	6.5	0.81	-0.1	16 8.2	3 49.9	+ 9 36.7	+0.5953	0.5110	0.1969	+69	-10
26 Libræ	6.3	-0.86	+0.2	-17 26.0	7 48.2	-10 32.0	+1.2486	0.5134	-0.1923	+73	+37



## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
28	Libræ	6.2	-0.90	+ 0.1	-17 49.9	d 11 2.2	- 7 23.8	+1.0715	0.5153	-0.1885	+72 +21
32	Libræ	5.9	0.92	- 0.6	16 24.2	14 47.5	- 3 45.3	-1.1974	0.5177	0.1838	-38 -90
41	Libræ	5.3	1.00	0.0	19 0.3	20 5.5	+ 1 23.1	+0.7036	0.5212	0.1767	+71 - 3
$\kappa$	Libræ	5.0	1.02	0.0	19 23.2	21 36.1	+ 2 51.0	+0.8562	0.5222	0.1746	+71 + 6
$\lambda$	Libræ	4.9	1.08	0.2	19 53.9	8 3 12.3	+ 8 16.7	+0.4592	0.5260	0.1665	+57 -17
47	Libræ	5.8	-1.08	- 0.5	-19 7.1	4 2.1	+ 9 5.0	-0.5327	0.5266	-0.1652	+ 4 -77
10	G. Scorpii	5.9	1.11	0.1	20 43.4	5 18.6	+10 19.1	+1.0125	0.5276	0.1633	+69 +17
$\beta$	Scorpii	2.9	1.14	0.7	19 33.6	9 5.2	-10 1.6	-0.8633	0.5303	0.1574	-16 -90
56	B. Scorpii	5.0	1.14	0.7	19 33.4	9 5.4	-10 1.3	-0.8681	0.5303	0.1574	-16 -90
$\omega$	Scorpii	4.3	1.15	0.5	20 25.6	9 43.9	- 9 24.0	-0.0188	0.5308	0.1563	+29 -43
$\omega$	Scorpii	4.6	-1.16	- 0.4	-20 37.6	10 0.8	- 9 7.7	+0.1556	0.5309	-0.1559	+38 -33
84	B. Scorpii	6.3	1.19	0.6	20 52.8	13 23.8	- 5 51.2	-0.0866	0.5334	0.1503	+25 -47
51	G. Scorpii	6.5	1.21	0.6	21 4.8	14 34.8	- 4 42.5	-0.0441	0.5343	0.1483	+27 -44
$\omega$	Ophiuchi	4.5	1.28	1.1	21 16.5	21 42.1	+ 2 10.9	-0.8437	0.5396	0.1357	-17 -90
24	Ophiuchi	5.5	1.41	1.5	23 0.5	4 8 59.2	-10 54.7	-0.3730	0.5480	0.1139	+ 6 -65
137	B. Ophiuchi	6.3	-1.50	- 1.5	-25 8.7	15 51.7	- 4 16.5	+1.1959	0.5531	-0.0995	+65 +38
39	Ophiuchi	5.1	1.51	1.9	24 11.4	18 26.4	- 1 47.2	-0.0816	0.5549	0.0939	+19 -47
$\theta$	Ophiuchi	3.3	1.54	1.9	24 54.7	20 11.1	- 0 6.2	+0.5327	0.5562	0.0900	+53 -12
191	B. Ophiuchi	6.3	1.54	2.2	24 9.8	21 33.3	+ 1 13.1	-0.3925	0.5572	0.0870	+ 2 -67
$\delta$	Ophiuchi(var.)	4.4	1.54	2.3	24 5.6	22 6.6	+ 1 45.4	-0.5140	0.5576	0.0857	- 4 -77
51	Ophiuchi	4.8	-1.56	- 2.5	-23 53.7	5 0 19.0	+ 3 53.0	-0.9106	0.5590	-0.0807	-28 -90
63	Ophiuchi	6.1	1.66	3.2	24 52.2	10 24.3	-10 23.4	-0.5565	0.5656	0.0566	-10 -81
67	B. Sagittarii	6.4	1.74	4.1	25 38.4	20 25.3	- 0 44.5	-0.1782	0.5712	0.0314	+ 8 -53
70	B. Sagittarii	6.4	1.74	4.3	24 57.5	21 36.9	+ 0 24.4	-0.9371	0.5718	0.0283	-35 -90
68	G. Sagittarii	6.2	1.78	4.2	26 41.4	6 0 10.1	+ 2 51.8	+0.8333	0.5731	0.0216	+63 + 7
$\lambda$	Sagittarii	2.9	-1.77	- 4.5	-25 28.4	0 17.5	+ 2 58.9	-0.4562	0.5731	-0.0213	- 8 -72
69	G. Sagittarii	6.3	1.78	4.2	26 48.8	0 19.3	+ 3 0.7	+0.9600	0.5732	0.0212	+63 +17
86	B. Sagittarii	6.5	1.79	4.2	26 38.4	0 40.6	+ 3 21.2	+0.7705	0.5733	0.0203	+63 + 3
126	B. Sagittarii	5.7	1.80	5.3	25 6.2	7 15.6	+ 9 41.3	-0.9283	0.5762	0.0028	-36 -90
$\phi$	Sagittarii	3.3	1.83	4.9	27 5.1	7 33.9	+ 9 58.9	+1.1590	0.5763	-0.0020	+63 +35
$\sigma$	Sagittarii	2.3	-1.85	- 5.4	-26 24.6	11 31.2	-10 12.8	+0.4606	0.5777	+0.0087	+42 -16
162	B. Sagittarii	6.4	1.84	5.9	24 59.9	12 48.2	- 8 58.7	-1.0092	0.5782	0.0122	-41 -90
127	G. Sagittarii	6.4	1.84	5.9	25 4.2	13 38.8	- 8 10.1	-0.9235	0.5784	0.0145	-35 -90
172	B. Sagittarii	5.8	1.83	6.1	24 58.4	14 29.3	- 7 21.4	-1.0110	0.5787	0.0168	-41 -90
189	B. Sagittarii	6.1	1.85	6.3	24 48.0	16 50.7	- 5 5.4	-1.1438	0.5794	0.0232	-50 -90
201	B. Sagittarii	5.9	-1.88	- 6.3	-26 3.6	18 51.2	- 3 9.6	+0.2283	0.5799	+0.0287	+29 -29
$\psi$	Sagittarii	4.8	1.87	6.5	25 24.9	19 48.1	- 2 14.8	-0.4190	0.5801	0.0313	- 5 -69
$\chi$	Sagittarii	4.9	1.88	7.0	24 41.2	23 45.9	+ 1 33.8	-1.0328	0.5809	0.0422	-40 -90
51	Sagittarii	5.8	1.90	7.4	24 55.1	7 4 7.0	+ 5 44.9	-0.5784	0.5816	0.0541	-10 -83
$\lambda$	Sagittarii	4.7	1.90	7.4	25 5.1	4 23.2	+ 6 0.4	-0.3906	0.5816	0.0549	- 1 -67
NEW MOON.											
351	B. Aquarii	6.5	-1.56	-11.6	- 7 58.0	11 9 6.0	+ 7 0.1	-0.4279	0.5516	+0.2540	+18 -67
376	B. Aquarii	6.3	1.52	11.3	6 53.0	14 58.0	-11 19.9	-0.0077	0.5497	0.2583	+40 -42
30	Piscium	4.7	1.48	11.1	6 31.0	21 3.1	- 5 27.2	+1.2088	0.5481	0.2618	+84 +29
33	Piscium	4.7	-1.47	-11.0	- 6 12.8	22 35.5	- 3 58.0	+1.3088	0.5477	+0.2625	+84 +39
54	B. Ceti	6.3	1.41	10.0	2 43.2	12 7 20.3	+ 4 29.1	+0.1233	0.5460	0.2655	+48 -35
14	Ceti	5.4	1.38	9.4	- 1 0.2	12 23.5	+ 9 22.1	-0.2510	0.5452	0.2662	+29 -56
26	Ceti	6.0	1.27	8.4	+ 0 52.9	18 1 22.3	- 2 5.3	+1.3159	0.5444	0.2653	+90 +40
33	Ceti	6.1	1.25	7.9	1 57.9	4 28.1	+ 0 54.3	+1.0524	0.5445	0.2643	+90 +17
$f$	Piscium	5.1	-1.23	- 7.4	+ 3 8.3	7 47.3	+ 4 6.9	+0.7519	0.5446	+0.2631	+90 - 2
	SATURN				5 18.2	8 13.4	+ 4 32.0	-1.3028	0.5413	0.2614	-38 -85
$\mu$	Piscium	5.0	1.19	6.3	5 40.7	13 26.1	+ 9 34.3	-0.3161	0.5450	0.2605	+25 -59
$\xi$	Arietis	5.5	0.96	3.4	10 12.1	14 14 11.8	+ 9 29.4	+1.3595	0.5502	0.2397	+90 +52
31	Arietis	5.7	0.91	2.5	12 3.4	19 26.7	- 9 26.5	+0.7312	0.5518	0.2332	+90 + 1
$\alpha$	Arietis	5.8	-0.90	- 1.3	+14 55.8	22 56.8	- 6 3.7	-1.3629	0.5531	+0.2287	-54 -75

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
$\sigma$ Arietis	5.5	-0.86	-1.2	+14 42.7	15 2 1.1	- 3 5.8	-0.4456	0.5543	+0.2244	+18	-62
145 B. Arietis	6.5	0.79	-0.6	15 30.4	7 48.5	+ 2 29.4	+0.0240	0.5564	0.2159	+43	-34
175 B. Arietis	6.4	0.69	+1.0	18 26.5	17 29.8	+11 50.1	-0.9401	0.5604	0.1998	-11	-72
26 B. Tauri	6.4	0.64	0.8	17 32.3	20 33.4	- 9 12.9	+0.5816	0.5617	0.1943	+81	- 3
13 Tauri	5.6	0.60	1.7	19 24.8	16 0 2.3	- 5 51.6	-0.6611	0.5632	0.1878	+ 6	-69
14 Tauri	6.2	-0.60	+1.7	+19 22.9	0 39.7	- 5 15.6	-0.5125	0.5635	+0.1866	+14	-61
192 B. Tauri	6.1	0.44	3.3	22 11.0	12 55.0	+ 6 32.8	-1.2392	0.5688	0.1615	-40	-68
$\omega$ Tauri	4.8	0.41	2.7	20 21.5	14 47.4	+ 8 21.0	+0.9263	0.5696	0.1574	+90	+21
51 Tauri	5.6	0.40	3.1	21 21.6	15 14.4	+ 8 47.0	-0.0287	0.5697	0.1564	+40	-30
53 Tauri	5.3	0.40	2.9	20 55.6	15 41.2	+ 9 12.9	+0.4860	0.5699	0.1554	+74	- 4
56 Tauri	5.2	-0.40	+3.2	+21 33.5	15 45.1	+ 9 16.6	-0.1504	0.5699	+0.1553	+33	-37
224 B. Tauri	6.1	0.38	2.9	20 36.6	16 55.3	+10 24.2	+0.9999	0.5704	0.1526	+90	+27
227 B. Tauri	5.9	0.37	3.0	20 46.4	17 24.1	+10 52.0	+0.9055	0.5706	0.1516	+90	+21
$\kappa$ Tauri	4.1	0.36	3.4	22 5.4	18 8.3	+11 34.5	-0.3310	0.5709	0.1499	+24	-46
67 Tauri	5.4	0.36	3.4	21 59.7	18 9.6	+11 35.8	-0.2317	0.5709	0.1499	+29	-40
$\nu$ Tauri	4.2	-0.36	+3.6	+22 36.7	18 31.2	+11 56.5	-0.8082	0.5710	+0.1490	- 4	-67
72 Tauri	5.4	0.36	3.7	22 47.7	18 55.9	-11 39.7	-0.9360	0.5712	0.1481	-13	-67
247 B. Tauri	5.8	0.35	3.2	21 25.2	19 14.9	-11 21.4	+0.5196	0.5714	0.1474	+76	- 1
284 B. Tauri	6.0	0.30	4.0	23 9.5	22 44.0	- 8 0.2	-0.7632	0.5727	0.1393	- 1	-67
$\tau$ Tauri	4.5	0.26	3.9	22 47.2	17 1 7.2	- 5 42.2	-0.0552	0.5736	0.1337	+39	-29
95 Tauri	6.2	-0.26	+4.2	+23 55.2	1 30.4	- 5 19.9	-1.1683	0.5738	+0.1327	-33	-66
300 B. Tauri	6.2	0.24	4.2	23 27.9	2 32.1	- 4 20.6	-0.5656	0.5742	0.1303	+10	-59
315 B. Tauri	6.3	0.18	4.6	24 27.0	6 51.2	- 0 11.3	-1.0403	0.5756	0.1197	-21	-66
99 Tauri	6.0	0.18	4.4	23 48.6	7 29.8	+ 0 25.9	-0.3048	0.5758	0.1181	+25	-41
103 Tauri	5.5	-0.11	4.6	24 8.9	11 41.9	+ 4 28.4	-0.1793	0.5771	0.1076	+32	-34
118 Tauri	5.4	+0.02	+4.9	+25 4.8	20 16.7	-11 16.5	-0.3136	0.5793	+0.0853	+24	-39
121 Tauri	5.1	0.05	4.6	23 58.9	22 47.7	- 8 51.4	+1.0285	0.5798	0.0786	+90	+36
125 Tauri	5.1	0.08	5.2	25 50.9	18 0 29.7	- 7 13.2	-0.7741	0.5801	0.0741	- 3	-64
132 Tauri	5.0	0.13	4.8	24 32.4	4 15.8	- 3 35.9	-0.8424	0.5807	0.0639	+90	+25
139 Tauri	4.7	0.18	5.2	25 56.7	7 51.5	- 0 8.4	-0.4032	0.5810	0.0541	+19	-42
$\epsilon$ Geminorum	3.2	+0.44	+4.5	+25 13.3	19 2 23.7	- 6 19.2	+0.8810	0.5805	+0.0029	+90	+33
37 Geminorum	5.7	0.50	4.4	25 29.4	7 0.2	- 1 53.4	+0.5864	0.5797	-0.0097	+85	+15
39 Geminorum	6.2	0.52	4.6	26 12.1	8 24.6	- 0 32.2	-0.1744	0.5794	0.0136	+32	-25
40 Geminorum	6.3	0.52	4.5	26 2.3	8 40.8	- 0 16.6	-0.0074	0.5793	0.0143	+41	-16
47 Geminorum	5.6	0.59	4.5	27 0.4	13 31.3	+ 4 22.8	-1.1244	0.5781	0.0275	-31	-63
52 Geminorum	6.1	+0.59	+4.0	+25 2.6	14 54.4	+ 5 42.7	+0.8949	0.5777	-0.0312	+90	+32
134 B. Geminorum	6.5	0.62	4.4	26 51.2	15 50.6	+ 6 36.7	-1.0359	0.5773	0.0337	-23	-63
$\lambda$ Geminorum	5.1	0.63	3.8	25 13.5	18 30.5	+ 9 10.6	+0.5748	0.5764	0.0408	+83	+12
176 B. Geminorum	6.3	0.69	3.4	24 33.8	20 0 36.7	- 8 57.0	+0.9745	0.5741	0.0569	+90	+36
181 B. Geminorum	6.0	0.70	3.3	24 25.7	1 0.8	- 8 33.8	+1.0944	0.5739	0.0579	+90	+43
$\gamma$ Geminorum	5.5	+0.73	+3.5	+26 0.0	3 1.9	- 6 37.2	-0.6842	0.5731	-0.0631	+ 3	-62
$\kappa$ Geminorum	3.6	0.72	3.2	24 36.9	3 11.6	- 6 27.9	+0.7651	0.5730	0.0635	+90	+21
$\omega^t$ Cancri	6.0	0.80	3.0	25 38.4	10 4.9	+ 0 10.0	-0.8150	0.5697	0.0809	- 6	-64
5 B. Cancri	6.4	0.78	2.6	23 49.9	10 8.8	+ 0 13.8	+1.0916	0.5697	0.0810	+90	+41
4 Cancri	6.2	0.80	2.9	25 20.3	10 25.5	+ 0 29.9	-0.5238	0.5695	0.0817	+12	-52
35 B. Cancri	6.4	+0.82	+2.2	+23 24.6	15 31.7	+ 5 24.8	+1.0686	0.5668	-0.0941	+90	+38
$\lambda$ Cancri	5.9	0.85	2.1	24 18.4	18 26.4	+ 8 13.2	-0.1655	0.5651	0.1010	+32	-33
28 Cancri	6.1	0.88	1.9	24 26.7	21 54.9	+11 34.2	-0.6770	0.5630	0.1090	+ 4	-64
$\nu^t$ Cancri	5.7	0.89	1.8	24 23.1	23 10.3	-11 13.1	-0.7536	0.5623	0.1118	- 1	-66
$\mu^a$ Cancri	6.4	0.89	1.8	24 23.5	23 49.1	-10 35.7	-0.8332	0.5619	0.1133	- 6	-66
$\epsilon$ Cancri	5.2	+0.97	+0.2	+22 24.6	21 15 55.9	+ 4 57.2	-0.8303	0.5512	-0.1470	- 5	-68
79 Cancri	6.1	0.97	+0.2	22 21.7	16 22.7	+ 5 23.1	-0.8453	0.5509	0.1478	- 6	-68
90 H. Cancri	6.1	0.97	0.0	21 39.3	17 52.2	+ 6 49.5	-0.3119	0.5499	0.1507	+25	-46
57 B. Leonis	6.5	1.00	-1.4	19 16.6	22 8 10.3	- 3 21.0	-0.1041	0.5398	0.1757	+36	-37
$\eta$ Leonis	3.6	0.99	2.3	17 12.1	19 6.0	+ 7 13.6	+0.1192	0.5322	0.1919	+49	-28
42 Leonis	6.1	+0.98	-2.9	+15 25.7	23 2 12.8	- 9 53.1	+0.6348	0.5275	-0.2012	+86	- 2

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, //	y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$	"	d h m	h m				"	"
46 Leonis	5.8	+0.08	-3.3	+14 35.9	23 7 21.8	- 4 54.6	+0.4815	0.5240	-0.2073	+72	-11
k Leonis	5.5	0.97	3.8	14 40.1	14 32.4	+ 2 3.9	-1.1113	0.5195	0.2149	-22	-75
v Virginis	5.4	0.87	5.2	8 37.9	24 17 47.3	+ 4 31.2	-0.6996	0.5053	0.2351	+ 5	-81
v Virginis	4.2	0.84	5.3	7 1.9	21 46.5	+ 8 23.7	+0.1086	0.5035	0.2370	+48	-35
36 B. Virginis	6.5	0.80	5.7	6 3.6	25 7 30.6	- 6 8.7	-1.1510	0.5000	0.2405	-24	-84
c Virginis	5.1	+0.75	-5.9	+ 3 48.7	16 39.2	+ 2 44.8	-0.8913	0.4973	-0.2424	- 6	-86
46 Virginis	6.1	0.60	5.6	- 2 53.2	26 15 1.1	+ 0 30.3	+1.0674	0.4939	0.2419	+87	+7
48 Virginis	6.5	0.58	5.6	3 10.8	16 52.0	+ 2 18.2	+0.9462	0.4938	0.2416	+87	+9
65 Virginis	6.0	0.52	5.8	4 27.3	27 3 42.2	-11 9.3	-0.2455	0.4938	0.2385	+29	-56
66 Virginis	5.7	0.51	5.8	4 41.7	4 23.0	-10 29.6	-0.1418	0.4939	0.2383	+34	-50
72 Virginis	6.1	+0.48	-5.5	- 6 0.4	7 39.4	- 7 18.5	+0.5334	0.4941	-0.2370	+73	-14
l Virginis	4.8	0.48	5.6	5 47.6	8 31.3	- 6 28.0	+0.0906	0.4942	0.2366	+46	-37
80 Virginis	5.6	0.47	5.9	4 56.4	10 30.1	- 4 32.4	-1.3226	0.4944	0.2358	-41	-90
88 Virginis	6.5	0.42	5.8	6 23.4	17 35.4	+ 2 21.3	-1.3747	0.4954	0.2323	-51	-90
598 B. Virginis	6.1	0.39	5.6	7 37.1	21 16.5	+ 5 56.3	-0.8662	0.4960	0.2301	- 6	-90
623 B. Virginis	6.5	+0.35	-5.4	- 8 40.6	28 2 25.6	+10 56.9	-0.7033	0.4973	-0.2269	+ 3	-90
95 Virginis	5.4	0.34	5.4	8 53.1	3 43.4	-11 47.5	-0.9319	0.4975	0.2260	-11	-90
96 Virginis	6.5	0.32	5.2	9 54.6	4 57.9	-10 35.0	-0.0762	0.4978	0.2252	+35	-46
k Virginis	4.2	0.31	5.2	9 51.4	7 5.4	- 8 21.1	-0.6122	0.4984	0.2237	+ 8	-82
2 Libræ	6.3	0.26	5.0	11 18.3	12 48.4	- 2 57.6	-0.2727	0.5001	0.2192	+25	-58
4 G. Libræ	6.5	+0.25	-5.0	-11 15.8	13 29.4	- 2 17.7	-0.4690	0.5004	-0.2187	+14	-71
6 B. Libræ	6.2	+0.19	-5.0	-11 55.5	20 9.8	+ 4 11.4	-1.1758	0.5027	-0.2129	-30	-90

## MARCH.

$\mu$ Libræ	5.4	+0.14	-4.7	-13 46.5	1 2 39.9	+10 30.4	-0.4883	0.5054	-0.2066	+12	-72
v Libræ	5.3	0.06	4.3	15 54.6	11 44.1	- 4 41.1	+0.0436	0.5095	0.1969	+38	-40
22 Libræ	6.5	0.05	4.2	16 8.2	11 50.0	- 4 35.4	+0.2764	0.5095	0.1967	+50	-27
26 Libræ	6.3	+0.01	3.9	17 26.0	15 49.8	- 0 42.6	+0.9326	0.5117	0.1921	+73	+10
28 Libræ	6.2	-0.02	3.8	17 50.0	19 5.1	+ 2 26.9	+0.7550	0.5134	0.1880	+72	- 1
41 Libræ	5.3	-0.10	-3.7	-19 0.4	2 4 12.9	+11 18.3	+0.3871	0.5184	-0.1759	+54	-21
k Libræ	5.0	0.12	3.6	19 23.3	5 44.4	-11 13.1	+0.5412	0.5193	0.1738	+63	-13
l Libræ	4.9	0.17	3.6	19 54.0	11 24.0	- 5 43.8	+0.1440	0.5228	0.1654	+39	-34
47 Libræ	5.8	0.18	3.9	19 7.1	12 14.3	- 4 55.1	-0.8539	0.5233	0.1642	-15	-90
10 G. Scorpii	5.9	0.20	3.4	20 43.4	13 31.6	- 3 40.2	+0.7016	0.5241	0.1622	+69	- 3
$\beta$ Scorpii	2.9	-0.23	-3.9	-19 33.6	17 20.8	+ 0 1.8	-1.1844	0.5265	-0.1561	-40	-90
56 B. Scorpii	5.0	0.23	3.9	19 33.4	17 21.1	+ 0 2.2	-1.1892	0.5265	0.1561	-41	-90
$\omega$ Scorpii	4.3	0.24	3.7	20 25.6	18 0.0	+ 0 39.9	-0.3340	0.5269	0.1551	+13	-62
$\omega$ Scorpii	4.6	0.24	3.6	20 37.6	18 17.2	+ 0 56.5	-0.1582	0.5271	0.1546	+22	-51
84 B. Scorpii	6.3	0.28	3.6	20 52.8	21 42.7	+ 4 15.5	-0.4000	0.5294	0.1489	+ 9	-67
51 G. Scorpii	6.5	-0.29	-3.6	-21 4.9	22 54.7	+ 5 25.2	-0.3566	0.5301	-0.1469	+11	-64
$\omega$ Ophiuchi	4.5	0.36	3.8	21 16.5	3 6 7.9	-11 35.5	-1.1570	0.5348	0.1342	-41	-90
24 Ophiuchi	5.5	0.49	3.6	23 0.6	17 35.4	- 0 30.7	-0.6731	0.5424	0.1121	-11	-90
88 B. Ophiuchi	6.3	0.51	2.9	24 57.4	19 0.2	+ 0 51.3	+1.2910	0.5434	0.1092	+65	+56
26 Ophiuchi	5.8	0.51	3.0	24 51.2	19 5.6	+ 0 56.5	+1.1683	0.5435	0.1091	+65	+34
137 B. Ophiuchi	6.3	-0.57	-3.1	-25 8.7	4 0 34.9	+ 6 14.6	+0.9158	0.5470	-0.0976	+65	+12
39 Ophiuchi	5.1	0.60	3.5	24 11.4	3 12.3	+ 8 46.6	-0.3695	0.5487	0.0920	+ 4	-66
$\theta$ Ophiuchi	3.3	0.62	3.4	24 54.7	4 58.8	+10 29.4	+0.2520	0.5498	0.0881	+36	-28
191 B. Ophiuchi	6.3	0.63	3.7	24 9.8	6 22.5	+11 50.2	-0.6792	0.5507	0.0851	-14	-90
b Ophiuchi(var.)	4.4	0.63	3.7	24 5.7	6 56.5	-11 37.0	-0.8011	0.5511	0.0838	-21	-90
136 G. Ophiuchi	6.3	-0.64	-3.1	-25 51.9	7 9.3	-11 24.5	+1.0977	0.5512	-0.0833	+64	+27
51 Ophiuchi	4.8	0.66	3.9	23 53.7	9 11.2	- 9 26.9	-1.1985	0.5525	0.0788	-51	-90
63 Ophiuchi	6.1	0.77	4.0	24 52.3	19 27.9	+ 0 28.1	-0.8282	0.5586	0.0548	-25	-90
66 B. Sagittarii	4.7	0.89	3.7	27 4.6	5 22.6	+10 1.4	+1.1131	0.5638	0.0304	+63	+30
67 B. Sagittarii	6.4	0.88	4.2	25 38.4	5 40.6	+10 18.7	-0.4320	0.5639	0.0297	- 6	-70
70 B. Sagittarii	6.4	-0.89	-4.5	-24 57.5	6 53.5	+11 28.9	-1.1953	0.5645	-0.0266	-55	-90

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	°	d h m	h m				°	°
68 G. Sagittarii	6.2	-0.92	-4.1	-26 41.4	5 9 29.6	-10 0.6	+0.5939	0.5658	-0.0200	+52	-8
$\lambda$ Sagittarii	2.9	0.92	4.5	25 28.4	9 37.2	-9 53.3	-0.7061	0.5658	0.0197	-22	-90
69 G. Sagittarii	6.3	0.93	4.0	26 48.8	9 39.0	-9 51.6	+0.7219	0.5658	0.0196	+63	0
86 B. Sagittarii	6.5	0.93	4.1	26 38.4	10 0.7	-9 30.7	+0.5314	0.5660	0.0187	+47	-12
126 B. Sagittarii	5.7	0.99	5.0	25 6.2	16 43.4	-3 2.9	-1.1705	0.5689	0.0013	-54	-90
$\phi$ Sagittarii	3.3	-1.00	-4.3	-27 5.1	17 2.0	-2 44.9	+0.9340	0.5690	-0.0005	+63	+14
$\sigma$ Sagittarii	2.3	1.04	4.8	26 24.6	21 3.8	+1 7.9	+0.2367	0.5705	+0.0102	+28	-28
162 B. Sagittarii	6.4	1.04	5.3	24 59.9	22 22.2	+2 23.4	-1.2422	0.5710	0.0137	-61	-90
127 G. Sagittarii	6.4	1.05	5.3	25 4.2	23 13.7	+3 12.9	-1.1543	0.5712	0.0159	-52	-90
172 B. Sagittarii	5.8	1.06	5.4	24 58.4	6 0 5.2	+4 2.5	-1.2410	0.5715	0.0182	-61	-90
201 B. Sagittarii	5.9	-1.10	-5.3	-26 3.6	4 31.9	+8 19.1	+0.0156	0.5728	+0.0301	+18	-41
$\psi$ Sagittarii	4.8	1.11	5.5	25 24.8	5 29.8	+9 14.9	-0.6345	0.5730	0.0327	-16	-90
$\chi$ Sagittarii	4.9	1.14	6.0	24 41.1	9 31.8	-10 52.2	-1.2450	0.5740	0.0435	-60	-90
51 Sagittarii	5.8	1.18	6.1	24 55.1	13 57.4	-6 36.6	-0.7788	0.5748	0.0554	-22	-90
$h$ Sagittarii	4.7	1.18	6.1	25 5.1	14 13.8	-6 20.9	-0.5892	0.5748	0.0562	-12	-85
308 B. Sagittarii	6.3	-1.24	-6.8	-24 10.0	21 28.8	+0 37.6	-1.0661	0.5758	+0.0756	-40	-90
36 B. Capricorni	6.2	1.33	7.8	22 41.6	7 11 57.1	-9 27.0	-1.2142	0.5758	0.1136	-50	-90
56 B. Capricorni	6.3	1.36	7.6	24 6.3	16 18.0	-5 16.0	+0.7616	0.5755	0.1247	+66	+1
17 Capricorni	5.8	1.37	8.3	21 50.6	18 48.6	-2 51.1	-1.2439	0.5751	0.1310	-52	-90
$\chi$ Capricorni	5.3	1.42	8.7	21 33.5	8 4 4.1	+6 3.5	-0.2150	0.5737	0.1535	+18	-54
27 Capricorni	6.1	-1.42	-9.0	-20 55.2	4 28.9	+6 27.3	-0.8025	0.5736	+0.1544	-14	-90
$\phi$ Capricorni	5.3	1.43	8.9	21 1.7	7 0.5	+8 53.3	-0.2941	0.5731	0.1603	+14	-59
33 Capricorni	5.3	1.45	9.0	21 14.2	10 33.4	-11 41.8	+0.5020	0.5723	0.1684	+58	-14
35 Capricorni	6.0	1.46	9.0	21 35.3	11 50.6	-10 27.5	+1.0776	0.5719	0.1713	+68	+22
128 B. Capricorni	6.5	1.45	9.4	19 32.6	13 0.5	-9 20.2	-0.8012	0.5717	0.1739	-12	-90
37 Capricorni	5.7	-1.46	-9.3	-20 29.3	15 2.0	-7 23.2	+0.5156	0.5712	+0.1782	+60	-14
$\epsilon$ Capricorni	4.7	1.46	9.4	19 52.3	15 58.2	-6 29.1	+0.0582	0.5709	0.1803	+34	-39
$\kappa$ Capricorni	4.8	1.47	9.6	19 16.8	18 18.6	-4 13.9	-0.1151	0.5703	0.1853	+26	-49
143 B. Capricorni	6.1	1.48	9.5	-20 2.1	18 32.7	-4 0.4	+0.6936	0.5703	0.1858	+70	-4
NEW MOON.											
$\mu$ SATURN	..	..	..	+ 6 27.0	12 21 37.0	- 4 26.2	-0.9615	0.5500	+0.2655	-10	-84
$\sigma$ Piscium	5.0	-1.42	-7.1	5 40.7	21 56.7	- 4 7.2	-0.1127	0.5544	0.2671	+36	-47
31 Arietis	4.4	1.41	6.0	8 42.2	18 4 39.1	+ 2 21.1	-1.3246	0.5555	0.2625	-41	-81
$\sigma$ Arietis	5.7	1.26	3.6	12 3.4	14 2 56.8	- 0 8.7	+0.9678	0.5613	0.2388	+90	+15
$\sigma$ Arietis	5.8	-1.27	-2.6	+14 55.8	6 19.8	+ 3 6.9	-1.0895	0.5625	+0.2340	-20	-75
145 B. Arietis	5.5	1.23	2.4	14 42.7	9 18.1	+ 5 58.8	-0.1831	0.5635	0.2295	+32	-46
175 B. Arietis	6.5	1.19	1.8	15 30.4	14 54.2	+11 22.7	+0.2849	0.5654	0.2205	+58	-21
26 B. Tauri	6.4	1.11	0.1	18 26.5	15 0 17.4	- 3 34.8	-0.6582	0.5690	0.2037	+ 6	-70
13 Tauri	6.4	1.07	-0.2	17 32.3	3 15.5	- 0 43.3	+0.8441	0.5701	0.1979	+90	+12
14 Tauri	5.6	-1.05	+0.7	+19 24.8	6 38.3	+ 2 32.0	-0.3799	0.5712	+0.1911	+22	-53
MARS	6.2	1.04	0.7	19 22.9	7 14.6	+ 3 6.9	-0.2330	0.5715	0.1899	+30	-44
$A^1$ Tauri	..	..	..	21 39.8	14 8.8	+ 9 45.5	-1.2737	0.5493	0.1699	-43	-68
39 Tauri	4.6	0.95	2.1	21 50.2	15 49.8	+11 22.7	-1.1564	0.5744	0.1714	-30	-68
192 B. Tauri	6.1	0.94	2.1	21 46.0	16 5.5	+11 37.8	-1.0412	0.5745	0.1708	-19	-68
$\omega$ Tauri	6.1	-0.91	+2.5	+22 11.0	19 10.1	- 9 24.6	-0.9481	0.5755	+0.1638	-13	-68
51 Tauri	4.8	0.87	2.0	20 21.5	20 59.7	- 7 39.2	+1.1924	0.5761	0.1595	+90	+42
53 Tauri	5.6	0.87	2.4	21 21.6	21 26.0	- 7 13.8	+0.2484	0.5763	0.1585	+57	-16
56 Tauri	5.3	0.86	2.3	20 55.6	21 52.2	- 6 48.6	+0.7574	0.5764	0.1575	+90	+11
224 B. Tauri	5.2	0.86	2.5	21 33.4	21 55.9	- 6 45.1	+0.1281	0.5765	0.1573	+50	-22
227 B. Tauri	6.1	-0.84	+2.2	+20 36.6	23 4.4	- 5 39.2	+1.2656	0.5768	+0.1546	+90	+52
$\kappa$ Tauri	5.9	0.84	2.3	20 46.4	23 32.6	- 5 12.0	+1.1724	0.5770	0.1535	+90	+41
67 Tauri	4.1	0.84	2.8	22 5.4	10 15.7	- 4 30.7	-0.0503	0.5772	0.1518	+39	-31
$\nu$ Tauri	5.4	0.83	2.8	21 59.7	0 17.0	- 4 29.4	+0.0479	0.5772	0.1517	+45	-26
72 Tauri	4.2	0.83	3.0	22 36.7	0 38.1	- 4 9.1	-0.5223	0.5773	0.1509	+13	-57
	5.4	-0.83	+3.1	+22 47.7	1 2.2	- 3 45.9	-0.6486	0.5774	+0.1499	+ 6	-65

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	$\gamma$	$x'$	$y'$	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
247 B. Tauri	5.8	-0.81	+2.6	+21 25.2	16 1 20.8	- 3 28.1	+0.7910	0.5775	+0.1491	+90	+14
284 B. Tauri	6.0	0.78	3.4	23 9.5	4 45.1	- 0 11.6	-0.4782	0.5784	0.1408	+16	-54
r Tauri	4.5	0.74	3.4	22 47.2	7 5.3	+ 2 3.3	+0.2223	0.5790	0.1350	+56	-15
95 Tauri	6.2	0.75	3.8	23 55.2	7 28.0	+ 2 25.0	-0.8798	0.5791	0.1340	- 9	-66
300 B. Tauri	6.2	0.73	3.8	23 27.9	8 28.4	+ 3 23.1	-0.2832	0.5793	0.1314	+26	-42
315 B. Tauri	6.3	-0.67	+4.3	+24 27.0	12 42.2	+ 7 27.1	-0.7547	0.5803	+0.1206	- 1	-66
99 Tauri	6.0	0.66	4.1	23 48.6	13 20.1	+ 8 3.6	-0.0261	0.5805	0.1190	+41	-26
k Tauri	5.6	0.66	4.5	24 54.8	13 27.3	+ 8 10.5	-1.1372	0.5805	0.1187	-30	-65
103 Tauri	5.5	0.59	4.4	24 8.9	17 27.6	-11 58.5	+0.0970	0.5812	0.1081	+48	-19
118 Tauri	5.4	0.46	5.1	25 4.8	17 1 54.2	- 3 51.6	-0.0399	0.5822	0.0853	+40	-24
125 Tauri	5.1	-0.40	+5.5	+25 50.9	6 3.8	+ 0 8.2	-0.4997	0.5825	+0.0738	+14	-49
132 Tauri	5.0	0.34	5.1	24 32.4	9 47.2	+ 3 42.9	+1.1049	0.5826	0.0635	+90	+44
139 Tauri	4.7	-0.28	5.7	25 56.7	13 20.6	+ 7 8.0	-0.1360	0.5825	0.0536	+34	-26
e Geminorum	3.2	+0.02	5.5	25 13.4	18 7 45.8	+ 0 50.2	+1.1293	0.5796	+0.0019	+90	+51
37 Geminorum	5.7	0.09	5.6	25 29.4	12 21.8	+ 5 15.5	+0.8313	0.5783	-0.0108	+90	+29
39 Geminorum	6.2	+0.11	+5.8	+26 12.1	13 46.1	+ 6 36.7	+0.0704	0.5778	-0.0147	+46	-12
40 Geminorum	6.3	0.12	5.8	26 2.3	14 2.3	+ 6 52.2	+0.2368	0.5777	0.0154	+57	- 3
47 Geminorum	5.6	0.20	6.0	27 0.4	18 52.9	+11 31.7	-0.8845	0.5758	0.0286	-10	-63
52 Geminorum	6.1	0.22	5.3	25 2.6	20 16.1	-11 8.3	+1.1321	0.5753	0.0324	+90	+49
134 B. Geminorum	6.5	0.24	5.8	26 51.2	21 12.3	-10 14.2	-0.7990	0.5750	0.0349	- 5	-63
A Geminorum	5.1	+0.27	+5.2	+25 13.5	23 52.6	- 7 40.0	+0.8083	0.5738	-0.0420	+90	+25
176 B. Geminorum	6.3	0.36	4.8	24 33.8	19 6 0.2	- 1 46.1	+1.2013	0.5710	0.0580	+90	+53
c Geminorum	5.5	0.40	5.2	26 0.0	8 26.0	+ 0 34.3	-0.4618	0.5698	0.0642	+16	-46
k Geminorum	3.6	0.39	4.7	24 36.9	8 35.8	+ 0 43.7	+0.9888	0.5697	0.0646	+90	+34
ω <sup>1</sup> Cancri	6.0	0.50	4.7	25 38.5	15 31.6	+ 7 24.2	-0.6028	0.5658	0.0819	+ 8	-57
4 Cancri	6.2	+0.50	+4.6	+25 20.3	15 52.4	+ 7 44.2	-0.3116	0.5656	-0.0827	+25	-39
ψ Cancri	5.9	0.55	4.5	25 46.9	19 35.4	+11 19.1	-1.1070	0.5633	0.0917	-28	-64
35 B. Cancri	6.4	0.55	3.8	23 24.6	21 1.0	-11 18.4	+1.2768	0.5624	0.0951	+90	+60
λ Cancri	5.9	0.60	3.9	24 18.4	23 57.2	- 8 28.6	+0.0356	0.5606	0.1019	+44	-22
28 Cancri	6.1	0.64	3.7	24 26.7	20 3 27.7	- 5 5.6	-0.4828	0.5584	0.1099	+15	-52
ν <sup>1</sup> Cancri	5.7	+0.65	+3.6	+24 23.2	4 43.8	- 3 52.2	-0.5615	0.5576	-0.1127	+11	-57
1 <sup>a</sup> Cancri	6.4	0.66	3.6	24 23.5	5 23.0	- 3 14.4	-0.6426	0.5572	0.1142	+ 6	-62
ξ Cancri	5.2	0.82	2.0	22 24.6	21 40.9	-11 30.3	-0.6683	0.5460	0.1476	+ 5	-66
79 Cancri	6.1	0.82	1.9	22 21.8	22 8.1	-11 4.1	-0.6843	0.5457	0.1485	+ 4	-67
90 H. Cancri	6.1	0.83	+1.6	21 39.3	23 38.7	- 9 36.5	-0.1515	0.5446	0.1514	+34	-37
57 B. Leonis	6.5	+0.93	0.0	+19 16.7	21 14 8.2	+ 4 24.3	+0.0290	0.5346	-0.1762	+44	-30
η Leonis	3.6	0.98	-1.2	17 12.1	22 1 13.0	- 8 51.9	+0.2301	0.5272	0.1924	+55	-22
42 Leonis	6.1	1.01	2.1	15 25.7	8 25.6	- 1 52.7	+0.7319	0.5226	0.2018	+90	+ 3
46 Leonis	5.8	1.03	2.6	14 35.9	13 38.8	+ 3 10.9	+0.5658	0.5194	0.2079	+79	- 7
k Leonis	5.5	1.06	3.1	14 40.2	20 55.0	+10 14.0	-1.0515	0.5152	0.2156	-18	-75
ω Virginis	5.4	+1.08	-5.6	+ 8 37.8	24 0 28.1	-11 0.4	-0.7052	0.5024	-0.2363	+ 5	-81
ν Virginis	4.2	1.08	6.0	7 1.9	4 29.5	- 7 5.9	+0.0959	0.5010	0.2383	+48	-36
b Virginis	5.2	1.06	6.5	4 9.3	12 12.4	+ 0 24.2	+1.4117	0.4986	0.2413	+90	+61
36 B. Virginis	6.5	1.08	6.6	6 3.6	14 18.2	+ 2 26.5	-1.1924	0.4980	0.2421	-27	-84
c Virginis	5.1	1.06	7.1	+ 3 48.7	23 30.4	+11 23.7	-0.9546	0.4960	0.2442	- 9	-86
γ Virginis (mean)	2.9	+1.02	-7.6	- 0 57.5	25 11 23.8	- 1 2.3	+1.4045	0.4942	-0.2451	+89	+54
46 Virginis	6.1	1.01	7.8	2 53.2	21 57.7	+ 9 14.4	+0.9554	0.4937	0.2441	+87	+ 9
48 Virginis	6.5	1.01	7.9	3 10.9	23 48.9	+11 2.6	+0.8297	0.4937	0.2438	+87	+ 2
65 Virginis	6.0	0.98	8.2	4 27.4	26 10 40.2	- 2 23.7	-0.3884	0.4941	0.2408	+21	-65
66 Virginis	5.7	0.98	8.2	4 41.8	11 21.0	- 1 44.0	-0.2859	0.4942	0.2405	+27	-58
72 Virginis	6.1	+0.97	-8.1	- 6 0.5	14 37.6	+ 1 27.3	+0.3837	0.4945	-0.2393	+63	-22
l Virginis	4.8	0.96	8.2	5 47.6	15 29.6	+ 2 17.8	-0.0617	0.4946	0.2390	+38	-46
m Virginis	5.4	0.94	8.0	8 15.1	20 50.5	+ 7 30.0	+1.3948	0.4954	0.2365	+82	+54
598 B. Virginis	6.1	0.92	8.3	7 37.1	27 4 15.0	- 9 17.6	-1.0450	0.4968	0.2325	-17	-90
623 B. Virginis	6.5	0.90	8.2	8 49.7	9 24.0	- 4 17.1	-0.8910	0.4979	0.2291	- 8	-90
95 Virginis	5.4	+0.90	-8.2	- 8 53.2	10 41.8	- 3 1.4	-1.1223	0.4983	-0.2282	-24	-90

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.												
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.		
Name.	Mag.	Red'ns from 1910.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>y</i>	<i>x</i>	<i>y</i>	N.	S.	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m						
96 Virginis	6.5	+0.90	-8.1	-9 54.6	27 11 56.2	-1 49.0	-0.2671	0.4987	-0.2274	+26	-57	
$\kappa$ Virginis	4.2	0.89	8.1	9 51.4	14 3.7	+0 14.9	-0.8078	0.4993	0.2258	-3	-90	
2 Libræ	6.3	0.86	8.0	11 18.3	19 46.6	+5 48.2	-0.4768	0.5010	0.2213	+14	-71	
4 G. Libræ	6.5	0.86	8.0	11 15.8	20 27.6	+6 28.1	-0.6746	0.5013	0.2208	+4	-89	
$\mu$ Libræ	5.4	0.80	7.7	13 46.6	28 9 38.1	-4 43.8	-0.7128	0.5061	0.2084	0	-90	
8 Libræ	5.4	+0.80	-7.4	-15 37.5	10 20.3	-4 2.8	+1.1939	0.5064	-0.2077	+74	+29	
$\alpha^a$ Libræ	2.9	0.80	7.4	15 40.2	10 26.4	-3 56.9	+1.2227	0.5064	0.2076	+74	+32	
$\nu$ Libræ	5.3	0.76	7.3	15 54.6	18 42.6	+4 5.0	-0.1906	0.5100	0.1984	+26	-53	
22 Libræ	6.5	0.75	7.3	16 8.3	18 48.5	+4 10.7	+0.0429	0.5101	0.1983	+57	-40	
26 Libræ	6.3	0.73	7.0	17 26.1	22 48.7	+8 3.8	+0.6970	0.5120	0.1934	+73	-4	
28 Libræ	6.2	+0.72	-6.9	-17 50.0	29 2 4.3	+11 13.7	+0.5157	0.5136	-0.1893	+63	-14	
11 H. Libræ	5.4	0.68	6.5	19 22.0	8 2.2	-6 59.1	+1.1073	0.5166	0.1813	+71	+23	
41 Libræ	5.3	0.66	6.6	19 0.5	11 13.5	-3 53.5	+0.1387	0.5182	0.1768	+40	-35	
$\kappa$ Libræ	5.0	0.65	6.5	19 23.4	12 45.3	-2 24.5	+0.2923	0.5190	0.1747	+48	-26	
$\lambda$ Libræ	4.9	0.62	6.4	19 54.0	18 26.2	+3 6.0	-0.1106	0.5222	0.1662	+25	-49	
47 Libræ	5.8	+0.61	-6.6	-19 7.2	19 16.8	+3 55.1	-1.1138	0.5226	-0.1648	-32	-90	
10 G. Scorpii	5.9	0.60	6.1	20 43.5	20 34.5	+5 10.4	+0.4486	0.5233	0.1629	+56	-18	
$\omega^1$ Scorpii	4.3	0.57	6.2	20 25.7	30 1 4.4	+9 31.9	-0.5949	0.5258	0.1556	-1	-84	
$\omega^2$ Scorpii	4.6	0.57	6.1	20 37.7	1 21.6	+9 48.5	-0.4184	0.5260	0.1551	+8	-68	
84 B. Scorpii	6.3	0.55	6.0	20 52.9	4 48.4	-10 51.2	-0.6633	0.5279	0.1493	-5	-90	
51 G. Scorpii	6.5	+0.54	-6.0	-21 4.9	6 0.9	-9 41.0	-0.6201	0.5286	-0.1472	-3	-86	
$\rho$ Ophiuchi	4.7	0.51	5.3	23 14.5	10 7.4	-5 42.3	+1.1706	0.5310	0.1400	+67	+32	
24 Ophiuchi	5.5	0.39	5.3	23 0.6	31 0 51.8	+8 33.3	-0.9449	0.5394	0.1119	-27	-90	
88 B. Ophiuchi	6.3	0.38	4.6	24 57.4	2 17.5	+9 56.2	+1.0341	0.5403	0.1090	+65	+21	
26 Ophiuchi	5.8	0.38	4.7	24 51.2	2 22.9	+10 1.5	+0.9105	0.5403	0.1088	+65	+11	
137 B. Ophiuchi	6.3	+0.33	-4.5	-25 8.7	7 56.3	-8 36.3	+0.6564	0.5434	-0.0973	+62	-5	
39 Ophiuchi	5.1	0.30	4.8	24 11.4	10 35.8	-6 2.2	-0.6395	0.5448	0.0916	-11	-90	
$\theta$ Ophiuchi	3.3	0.29	4.6	24 54.7	12 23.9	-4 17.8	-0.0127	0.5458	0.0877	+22	-43	
191 B. Ophiuchi	6.3	0.27	4.8	24 9.8	13 48.7	-2 55.8	-0.9521	0.5466	0.0846	-30	-90	
$\delta$ Ophiuchi (var.)	4.4	0.27	4.9	24 5.7	14 23.2	-2 22.5	-1.0750	0.5468	0.0833	-39	-90	
136 G. Ophiuchi	6.3	+0.27	-4.2	-25 51.9	14 36.2	-2 10.0	+0.8409	0.5469	-0.0828	+64	+7	
151 G. Ophiuchi	6.0	+0.25	-4.1	-26 12.1	16 46.1	-0 4.5	+1.0337	0.5481	-0.0780	+64	+21	
APRIL.												
63 Ophiuchi	6.1	+0.14	-4.5	-24 52.3	1 3 6.9	+9 54.7	-1.1009	0.5532	-0.0542	-44	-90	
66 B. Sagittarii	4.7	0.04	3.6	27 4.6	13 13.0	-4 20.5	+0.8644	0.5575	0.0298	+63	+9	
67 B. Sagittarii	6.4	+0.04	4.2	25 38.4	13 31.3	-4 2.9	-0.6973	0.5576	0.0291	-20	-90	
68 G. Sagittarii	6.2	0.00	3.8	26 41.4	17 25.2	-0 17.3	+0.3418	0.5590	0.0194	+35	-23	
$\lambda$ Sagittarii	2.9	-0.01	4.2	25 28.4	17 32.9	-0 9.9	-0.9728	0.5591	0.0191	-38	-90	
69 G. Sagittarii	6.3	-0.01	-3.7	-26 48.8	17 34.8	-0 8.1	+0.4713	0.5591	-0.0190	+43	-15	
86 B. Sagittarii	6.5	0.01	3.8	26 38.4	17 56.9	+0 13.2	+0.2788	0.5593	-0.0181	+31	-26	
$\phi$ Sagittarii	3.3	0.08	3.6	27 5.1	2 1 7.6	+7 8.4	+0.6904	0.5616	0.0000	+58	-2	
$\sigma$ Sagittarii	2.3	0.13	3.8	26 24.6	5 15.0	+11 6.8	-0.0127	0.5627	+0.0106	+14	-43	
201 B. Sagittarii	5.9	0.22	3.8	26 3.6	12 54.0	-5 31.0	-0.2312	0.5646	0.0303	+4	-56	
$\psi$ Sagittarii	4.8	-0.23	-4.2	-25 24.8	13 53.5	-4 33.6	-0.8886	0.5647	+0.0329	-31	-90	
248 B. Sagittarii	5.7	0.29	3.5	27 40.3	19 55.7	+1 15.3	+1.2278	0.5657	0.0486	+63	+45	
51 Sagittarii	5.8	0.32	4.3	24 55.1	22 34.1	+3 47.8	-1.0280	0.5660	0.0554	-38	-90	
$\kappa$ Sagittarii	4.7	0.33	4.3	25 5.0	22 51.0	+4 4.2	-0.8356	0.5660	0.0562	-25	-90	
$\omega$ Sagittarii	4.8	0.41	3.7	26 32.4	3 6 53.5	+11 48.9	+1.2390	0.5667	0.0769	+63	+45	
$\lambda$ Sagittarii	4.9	-0.43	-3.8	-26 26.4	8 12.8	-10 54.8	+1.2373	0.5667	+0.0803	+64	+45	
56 B. Capricorni	6.3	0.60	4.5	24 6.3	1 37.9	+5 51.9	+0.5606	0.5661	0.1240	+58	-11	
86 B. Capricorni	6.2	0.67	4.7	24 7.3	7 5.0	+11 7.0	+1.2869	0.5654	0.1371	+66	+51	
$\chi$ Capricorni	5.3	0.73	5.5	21 33.4	13 43.3	-6 29.3	-0.4110	0.5645	0.1525	+7	-68	
27 Capricorni	6.1	0.74	5.7	20 55.2	14 8.8	-6 4.8	-1.0047	0.5644	0.1535	-27	-90	
$\phi$ Capricorni	5.3	-0.76	-5.7	-21 1.6	16 44.4	-3 34.8	-0.4864	0.5640	+0.1594	+5	-74	

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
33 Capricorni	5.3	-0.80	-5.6	-21 14.2	4 20 22.9	- 0 4.2	+0.3243	0.5633	+0.1675	+47	-24
35 Capricorni	6.0	0.81	5.5	21 35.3	21 42.0	+ 1 12.0	+0.9083	0.5631	0 1703	+68	+10
128 B. Capricorni	6.5	0.82	6.1	19 32.5	22 53.7	+ 2 21.1	-0.9801	0.5628	0.1729	-24	-90
37 Capricorni	5.7	0.84	5.8	20 29.3	5 0 58.4	+ 4 21.2	+0.3454	0.5624	0.1773	+50	-23
ε Capricorni	4.7	0.85	6.0	19 52.3	1 56.0	+ 5 16.8	-0.1153	0.5622	0.1793	+25	-49
κ Capricorni	4.8	-0.86	-6.2	-19 16.7	4 19.8	+ 7 35.4	-0.2863	0.5618	+0.1843	+17	-59
143 B. Capricorni	6.1	0.87	5.9	20 2.0	4 34.3	+ 7 49.3	+0.5311	0.5617	0.1848	+61	-13
154 B. Capricorni	6.1	0.90	6.2	19 2.7	8 13.7	+11 20.8	+0.2083	0.5609	0.1922	+43	-30
161 B. Capricorni	6.4	0.94	6.4	18 20.3	12 46.6	- 8 16.0	+0.3814	0.5600	0.2010	+54	-22
29 Aquarii (mean)	6.5	0.94	6.6	17 24.0	12 53.7	- 8 9.2	-0.5488	0.5600	0.2012	+ 5	-78
56 Aquarii	6.1	-1.04	-7.1	-15 2.9	6 1 2.1	+ 3 33.2	-0.3528	0.5574	+0.2227	+18	-63
69 Aquarii	5.6	1.09	7.2	14 32.0	8 40.9	+10 55.8	-0.8767	0.5560	0.2346	+75	+ 5
τ Aquarii	4.4	1.10	7.3	14 4.2	9 30.8	+11 44.0	+0.6064	0.5558	0.2358	+72	-10
74 Aquarii	5.8	1.11	7.7	12 5.8	11 13.9	-10 36.6	-0.9657	0.5556	0.2382	-14	-90
257 B. Aquarii	6.3	1.13	7.3	13 33.3	13 55.4	- 8 0.7	+1.1418	0.5552	0.2420	+76	+24
290 B. Aquarii	6.3	-1.17	-7.7	-11 10.8	20 36.0	- 1 34.2	+0.4084	0.5543	+0.2504	+62	-21
ψ <sup>1</sup> Aquarii	4.5	1.17	8.0	9 34.8	21 7.7	- 1 3.6	-1.0548	0.5542	0.2510	-19	-90
ψ <sup>2</sup> Aquarii	4.6	1.18	7.9	9 40.6	22 2.1	- 0 11.1	-0.7308	0.5540	0.2521	+ 1	-90
ψ <sup>3</sup> Aquarii	5.2	1.18	7.8	10 6.3	22 30.1	+ 0 15.9	-0.1852	0.5540	0.2526	+30	-53
336 B. Aquarii	6.3	1.21	7.9	- 9 45.8	7 2 58.0	+ 4 34.6	+0.6127	0.5535	0.2574	+77	-10
NEW MOON.											
175 B. Arietis	6.4	-1.38	-1.0	+18 26.5	11 9 33.5	+ 7 29.3	-0.4913	0.5790	+0.2089	+16	-61
26 B. Tauri	6.4	1.35	1.0	17 32.3	12 25.6	+10 14.7	+0.9914	0.5802	0.2030	+90	+22
13 Tauri	5.6	1.34	0.2	19 24.7	15 41.4	-10 37.0	-0.2087	0.5816	0.1960	+31	-43
14 Tauri	6.2	-1.34	-0.2	+19 22.9	16 16.4	-10 3.4	-0.0635	0.5819	+0 1948	+39	-34
22 H. Tauri	6.1	1.35	+0.1	20 38.7	16 32.1	- 9 48.3	-1.2627	0.5820	0.1942	-40	-69
A' Tauri	4.6	1.29	1.1	21 50.2	12 0 33.5	- 2 5.7	-0.9614	0.5852	0.1758	-13	-68
39 Tauri	6.1	1.28	1.1	21 46.0	0 48.6	- 1 51.2	-0.8480	0.5853	0.1752	- 6	-68
192 B. Tauri	6.1	1.26	1.5	22 11.0	3 46.6	+ 0 59.8	-0.7530	0.5863	0.1680	0	-68
51 Tauri	5.6	-1.23	+1.5	+21 21.6	5 57.7	+ 3 5.8	+0.4260	0.5871	+0.1626	+69	- 7
53 Tauri	5.3	1.22	1.4	20 55.5	6 22.9	+ 3 30.0	+0.9269	0.5873	0.1615	+90	+22
56 Tauri	5.2	1.22	1.6	21 33.4	6 26.5	+ 3 33.4	+0.3082	0.5873	0.1614	+62	-13
κ Tauri	4.1	1.20	1.9	22 5.3	8 41.3	+ 5 42.8	+0.1349	0.5880	0.1557	+50	-21
67 Tauri	5.4	1.20	1.9	21 59.7	8 42.5	+ 5 44.0	+0.2315	0.5880	0.1556	+56	-16
ν Tauri	4.2	-1.21	+2.1	+22 36.6	9 2.9	+ 6 3.6	-0.3289	0.5881	+0.1548	+24	-46
72 Tauri	5.4	1.21	2.2	22 47.7	9 26.1	+ 6 25.8	-0.4528	0.5882	0.1538	+17	-53
247 B. Tauri	5.8	1.19	1.8	21 25.2	9 44.0	+ 6 43.1	+0.9632	0.5883	0.1530	+90	+25
284 B. Tauri	6.0	1.17	2.5	23 9.5	13 1.0	+ 9 52.2	-0.2820	0.5892	0.1444	+27	-42
τ Tauri	4.5	1.14	2.6	22 47.1	15 16.2	-11 58.0	+0.4090	0.5898	0.1384	+68	- 5
95 Tauri	6.2	-1.15	+3.0	+23 55.2	15 38.0	-11 37.1	-0.6746	0.5899	+0.1374	+ 5	-65
300 B. Tauri	6.2	1.13	2.9	23 27.9	16 36.2	-10 41.3	-0.0871	0.5901	0.1348	+37	-31
315 B. Tauri	6.3	1.09	3.5	24 27.0	20 41.1	- 6 46.2	-0.5478	0.5910	0.1236	+12	-56
99 Tauri	6.0	1.07	3.4	23 48.6	21 17.6	- 6 11.1	+0.1693	0.5911	0.1220	+52	-16
κ Tauri	5.6	1.08	3.7	24 54.8	21 24.6	- 6 4.4	-0.9235	0.5911	0.1216	+13	-65
103 Tauri	5.5	-1.02	+3.8	+24 8.9	13 1 16.3	- 2 22.1	+0.2932	0.5917	+0.1108	+60	- 9
MARS				24 19.2	4 32.9	+ 0 46.5	+0.4687	0.5670	0.0993	+74	+ 1
118 Tauri	5.4	0.92	4.6	25 4.8	9 25.4	+ 5 27.2	+0.1633	0.5924	0.0873	+52	-13
125 Tauri	5.1	0.86	5.2	25 50.9	13 26.6	+ 9 18.7	-0.2874	0.5923	0.0756	+26	-36
139 Tauri	4.7	0.76	5.6	25 56.7	20 29.1	- 7 55.9	+0.0734	0.5917	+0.0547	+47	-15
37 Geminorum	5.7	-0.40	+6.2	+25 29.4	14 18 50.2	-10 28.5	+1.0330	0.5851	-0.0111	+90	+42
39 Geminorum	6.2	0.38	6.4	26 12.1	20 12.4	- 9 9.5	+0.2816	0.5845	0.0150	+60	- 1
40 Geminorum	6.3	0.37	6.4	26 2.3	20 28.2	- 8 54.3	+0.4460	0.5843	0.0157	+72	+ 7
47 Geminorum	5.6	0.30	6.8	27 0.4	15 1 11.7	- 4 22.0	-0.6621	0.5820	0.0291	+ 4	-58
134 B. Geminorum	6.5	0.26	6.7	26 51.2	3 27.9	- 2 11.1	-0.5780	0.5808	0.0355	+ 9	-52
A Geminorum	5.1	-0.22	+6.2	+25 13.6	6 4.6	+ 0 19.5	+1.0114	0.5793	-0.0427	+90	+38

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle. H	y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
v Geminorum	4.3	-0.12	+6.8	+27 5.9	15 11 5.4	+ 5 8.7	-1.1864	0.5762	-0.0562	-38	-63
c Geminorum	5.5	0.07	6.4	26 0.0	14 27.5	+ 8 23.2	-0.2466	0.5740	0.0652	+28	-34
k Geminorum	3.6	-0.07	5.8	24 37.0	14 37.1	+ 8 32.4	+1.1898	0.5738	0.0656	+90	+51
$\omega^1$ Cancr	6.0	+0.04	6.1	25 38.5	21 25.6	- 8 54.5	-0.3886	0.5693	0.0829	+20	-43
4 Cancr	6.2	0.04	6.0	25 20.4	21 46.0	- 8 34.8	-0.1001	0.5690	0.0838	+37	-27
$\psi$ Cancr	5.9	+0.10	+6.0	+25 47.0	16 1 25.5	- 5 3.5	-0.8902	0.5662	-0.0928	-10	-64
$\lambda$ Cancr	5.9	0.16	5.4	24 18.5	5 43.5	- 0 55.0	+0.2414	0.5631	0.1030	+57	-12
28 Cancr	6.1	0.21	5.4	24 26.7	9 11.4	+ 2 25.4	-0.2749	0.5604	0.1110	+27	-39
$\iota^1$ Cancr	5.7	0.23	5.3	24 23.2	10 26.6	+ 3 37.9	-0.3537	0.5594	0.1139	+23	-44
$\iota^2$ Cancr	6.4	0.24	5.3	24 23.6	11 5.3	+ 4 15.2	-0.4345	0.5590	0.1153	+18	-49
$\xi$ Cancr	5.2	+0.45	+3.9	+22 24.7	17 3 14.7	- 4 9.2	-0.4709	0.5461	-0.1486	+17	-55
79 Cancr	6.1	0.46	3.9	22 21.8	3 41.7	- 3 43.1	-0.4870	0.5457	0.1494	+16	-56
90 H. Cancr	6.1	0.47	3.5	21 39.3	5 11.8	- 2 16.0	-0.0423	0.5445	0.1523	+45	-27
57 B. Leonis	6.5	0.63	2.0	19 16.7	19 38.6	+11 42.1	+0.2101	0.5331	0.1769	+55	-21
$\eta$ Leonis	3.6	0.73	+0.6	17 12.1	18 6 43.6	- 1 34.0	+0.3997	0.5250	0.1929	+67	-14
42 Leonis	6.1	+0.79	-0.3	+15 25.8	13 57.3	+ 5 26.3	+0.8934	0.5200	-0.2021	+90	+12
46 Leonis	5.8	0.82	0.8	14 36.0	19 11.7	+10 31.2	+0.7214	0.5166	0.2082	+90	+1
k Leonis	5.5	0.88	1.3	14 40.2	19 2 30.0	- 6 23.6	-0.9049	0.5122	0.2158	- 7	-75
$\iota$ Leonis	4.1	1.01	3.4	11 1.4	22 20.2	-11 7.6	-1.3752	0.5022	0.2319	-51	-79
$\omega$ Virginis	5.4	1.03	4.4	8 37.9	20 6 14.6	- 3 26.6	-0.6003	0.4991	0.2365	+11	-76
$\nu$ Virginis	4.2	+1.04	-5.0	+ 7 1.9	10 17.9	+ 0 29.9	+0.1954	0.4977	-0.2385	+53	-31
36 B. Virginis	6.5	1.08	5.9	6 3.6	20 11.2	+10 6.9	-1.1113	0.4950	0.2423	-20	-84
c Virginis	5.1	1.11	6.6	+ 3 48.7	21 5 27.6	- 4 51.7	-0.8889	0.4931	0.2445	- 5	-86
46 Virginis	6.1	1.16	8.3	- 2 53.2	22 4 3.8	- 6 52.0	+0.9850	0.4917	0.2449	+87	+10
48 Virginis	6.5	1.17	8.4	3 10.9	5 55.6	- 5 3.2	+0.8558	0.4918	0.2446	+87	+3
65 Virginis	6.0	+1.20	-8.8	- 4 27.4	16 50.0	+ 5 33.5	-0.3828	0.4928	-0.2419	+22	-64
66 Virginis	5.7	1.20	8.8	4 41.8	17 31.0	+ 6 13.5	-0.2814	0.4929	0.2416	+27	-58
72 Virginis	6.1	1.20	9.0	6 0.5	20 48.3	+ 9 25.4	+0.3835	0.4933	0.2404	+63	-22
$\iota$ Virginis	4.8	1.20	9.0	5 47.6	21 40.4	+10 16.2	-0.0639	0.4935	0.2401	+38	-46
m Virginis	5.4	1.20	9.2	8 15.1	23 3 2.4	- 8 30.6	+1.3853	0.4946	0.2378	+82	+50
598 B. Virginis	6.1	+1.22	-9.3	- 7 37.1	10 27.9	- 1 17.3	-1.0695	0.4963	-0.2338	-19	-90
623 B. Virginis	6.5	1.23	9.4	8 49.7	15 37.4	+ 3 43.8	-0.9235	0.4978	0.2306	-10	-90
95 Virginis	5.4	1.22	9.4	8 53.2	16 55.4	+ 4 59.6	-1.1571	0.4982	0.2298	-26	-90
96 Virginis	6.5	1.23	9.4	9 54.7	18 9.9	+ 6 12.1	-0.3030	0.4986	0.2289	+24	-60
$\kappa$ Virginis	4.2	1.23	9.4	9 51.5	20 17.4	+ 8 16.1	-0.8476	0.4993	0.2274	- 5	-90
2 Libræ	6.3	+1.24	-9.5	-11 18.4	24 2 0.5	-10 10.4	-0.5249	0.5014	-0.2230	+12	-75
4 G. Libræ	6.5	1.24	9.4	11 15.8	2 41.4	- 9 30.7	-0.7235	0.5016	0.2224	+ 1	-90
$\mu$ Libræ	5.4	1.24	9.3	13 46.6	15 51.6	+ 3 17.2	-0.7806	0.5069	0.2101	- 4	-90
8 Libræ	5.4	1.25	9.2	15 37.6	16 33.8	+ 3 58.2	+1.1268	0.5072	0.2094	+74	+23
$\alpha^a$ Libræ	2.9	1.25	9.2	15 40.2	16 39.9	+ 4 4.1	+1.1555	0.5073	0.2093	+74	+26
$\nu$ Libræ	5.3	+1.24	-9.1	-15 54.7	25 0 55.5	-11 54.7	-0.2699	0.5111	-0.2002	+22	-58
22 Libræ	6.5	1.25	9.1	16 8.3	1 1.4	-11 49.0	-0.0362	0.5112	0.2000	+34	-45
26 Libræ	6.3	1.25	8.9	17 26.1	5 1.1	- 7 56.3	+0.6136	0.5132	0.1952	+69	- 9
28 Libræ	6.2	1.25	8.8	17 50.1	8 16.4	- 4 46.7	+0.4285	0.5149	0.1910	+58	-20
11 H. Libræ	5.4	1.25	8.5	19 22.0	14 13.7	+ 0 59.8	+1.0138	0.5179	0.1830	+71	+16
41 Libræ	5.3	+1.24	-8.5	-19 0.5	17 24.6	+ 4 5.1	+0.0406	0.5196	-0.1785	+35	-40
$\kappa$ Libræ	5.0	1.24	8.4	19 23.4	18 56.2	+ 5 33.8	+0.1928	0.5204	0.1703	+43	-32
$\gamma$ Libræ	4.9	1.22	8.2	19 54.1	20 0 36.6	+11 3.9	-0.2164	0.5235	0.1677	+20	-55
47 Libræ	5.8	1.22	8.2	19 7.2	1 27.1	+11 52.8	-1.2221	0.5240	0.1664	-42	-90
10 G. Scorp	5.9	1.23	7.9	20 43.5	2 44.6	-10 52.0	+0.3416	0.5247	0.1643	+49	-24
$\omega^1$ Scorp	4.3	+1.21	-7.8	-20 25.7	7 14.1	- 6 31.0	-0.7081	0.5272	-0.1570	- 7	-90
$\omega^2$ Scorp	4.6	1.22	7.8	20 37.7	7 31.2	- 6 14.3	-0.5313	0.5274	0.1565	+ 3	-90
84 B. Scorp	6.3	1.21	7.6	20 52.9	10 57.8	- 2 54.3	-0.7799	0.5292	0.1506	-12	-90
51 G. Scorp	6.5	1.20	7.6	21 5.0	12 10.2	- 1 44.2	-0.7378	0.5299	0.1485	-10	-90
$\rho$ Ophiuchi	4.7	1.20	7.0	23 14.5	16 16.5	+ 2 14.3	+1.0533	0.5323	0.1409	+67	+21
126 B. Scorp	6.1	+1.18	-6.5	-24 17.7	23 52.6	+ 9 35.6	+1.1950	0.5303	-0.1270	+66	+36



ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ		d h m	h m					
24 Ophiuchi	5.5	+1.14	-6.4	-23 0.6	27 7 1.0	-7 30.1	-1.0785	0.5402	-0.1128	-36	-90
88 B. Ophiuchi	6.3	1.15	5.9	24 57.5	8 26.9	-6 7.0	+0.9063	0.5409	0.1099	+65	+11
26 Ophiuchi	5.8	1.15	6.0	24 51.2	8 32.3	-6 1.8	+0.7822	0.5409	0.1097	+65	+2
137 B. Ophiuchi	6.3	1.13	5.6	25 8.8	14 6.3	-0 38.9	+0.5241	0.5437	0.0980	+53	-13
39 Ophiuchi	5.1	1.10	5.7	24 11.5	16 46.2	+1 55.7	-0.7786	0.5450	0.0923	-18	-90
θ Ophiuchi	3.3	+1.10	-5.4	-24 54.7	18 34.6	+3 40.3	-0.1501	0.5458	-0.0884	+15	-51
191 B. Ophiuchi	6.3	1.08	5.5	24 9.8	19 59.7	+5 2.6	-1.0945	0.5465	0.0852	-40	-90
h Ophiuchi(var.)	4.4	1.08	5.6	24 5.7	20 34.4	+5 36.1	-1.2182	0.5468	0.0840	-52	-90
136 G. Ophiuchi	6.3	1.09	5.1	25 51.9	20 47.4	+5 48.6	+0.7062	0.5469	0.0835	+64	-2
151 G. Ophiuchi	6.0	1.08	4.9	26 12.2	22 57.8	+7 54.6	+0.8989	0.5479	0.0786	+64	+11
4 G. Sagittarii	6.2	+1.04	-4.3	-26 56.7	28 6 27.4	-8 51.2	+1.1839	0.5510	-0.0614	+63	+37
63 Ophiuchi	6.1	1.00	4.6	24 52.3	9 21.9	-6 2.8	-1.2512	0.5521	0.0546	-59	-90
66 B. Sagittarii	4.7	0.94	3.4	27 4.6	19 32.6	+3 46.6	+0.7228	0.5556	0.0301	+63	0
67 B. Sagittarii	6.4	0.92	3.9	25 38.4	19 51.2	+4 4.5	-0.8499	0.5557	0.0294	-29	-90
68 G. Sagittarii	6.2	0.90	3.3	26 41.4	23 47.3	+7 52.3	+0.1954	0.5568	0.0197	+26	-31
λ Sagittarii	2.9	+0.88	-3.7	-25 28.4	23 55.1	+7 59.8	-1.1289	0.5568	-0.0193	-49	-90
69 G. Sagittarii	6.3	0.90	3.3	26 48.8	23 57.0	+8 1.6	+0.3259	0.5568	0.0193	+34	-24
86 B. Sagittarii	6.5	0.89	3.3	26 38.4	29 0 19.4	+8 23.1	+0.1319	0.5569	0.0183	+23	-34
φ Sagittarii	3.3	0.83	2.8	27 5.1	7 34.9	-8 36.7	+0.5454	0.5586	-0.0002	+47	-11
σ Sagittarii	2.3	0.78	2.7	26 24.6	11 45.6	-4 35.1	-0.1641	0.5593	+0.0103	+6	-52
201 B. Sagittarii	5.9	+0.70	-2.4	-26 3.5	19 31.5	+2 54.1	-0.3856	0.5603	+0.0300	-3	-67
ψ Sagittarii	4.8	0.69	2.6	25 24.8	20 31.9	+3 52.4	-1.0496	0.5604	0.0325	-42	-90
248 B. Sagittarii	5.7	0.64	1.5	27 10.2	30 2 40.4	+9 47.5	+1.0880	0.5607	0.0481	+63	+27
51 Sagittarii	5.8	0.59	2.2	24 55.0	5 21.8	-11 36.9	-1.1916	0.5608	0.0549	-52	-90
h Sagittarii	4.7	0.59	2.2	25 5.0	5 39.0	-11 20.3	-0.9973	0.5608	0.0556	-36	-90
ω Sagittarii	4.8	+0.51	-1.2	-26 32.3	13 51.3	-3 25.7	+1.1011	0.5605	+0.0762	+63	+27
A Sagittarii	4.9	0.49	1.2	26 26.4	15 12.4	-2 7.6	+1.0997	0.5604	0.0795	+64	+27

MAY.

40 B. Capricorni	6.2	+0.32	-0.9	-25 14.9	1 5 52.8	-11 58.7	+1.2546	0.5587	+0.1151	+65	+45
56 B. Capricorni	6.3	0.29	1.0	24 6.2	9 3.1	-8 55.2	+0.4190	0.5582	0.1226	+49	-19
86 B. Capricorni	6.2	0.21	1.0	24 7.3	14 39.1	-3 31.2	+1.1573	0.5571	0.1354	+66	+31
χ Capricorni	5.3	0.12	1.6	21 33.4	21 28.9	+3 4.0	-0.5622	0.5556	0.1506	0	-81
27 Capricorni	6.1	0.11	1.8	20 55.1	21 55.1	+3 29.3	-1.1644	0.5555	0.1516	-40	-90
φ Capricorni	5.3	+0.08	-1.6	-21 1.6	2 0 35.4	+6 3.9	-0.6377	0.5549	+0.1573	-4	-88
33 Capricorni	5.3	0.03	1.5	21 14.1	4 20.6	+9 41.1	+0.1866	0.5540	0.1652	+40	-32
35 Capricorni	6.0	+0.02	1.3	21 35.2	5 42.2	+10 59.9	+0.7798	0.5537	0.1681	+68	+1
128 B. Capricorni	6.5	0.00	1.9	19 32.5	6 56.1	-11 48.8	-1.1450	0.5534	0.1705	-36	-90
37 Capricorni	5.7	-0.03	1.5	20 29.2	9 4.6	-9 44.8	+0.2102	0.5529	0.1749	+42	-31
ε Capricorni	4.7	-0.04	-1.7	-19 52.2	10 4.1	-8 47.3	-0.2568	0.5526	+0.1768	+18	-57
κ Capricorni	4.8	0.07	1.8	19 16.6	12 32.5	-6 24.1	-0.4289	0.5520	0.1818	+10	-69
143 B. Capricorni	6.1	0.07	1.6	20 2.0	12 47.4	-6 9.8	+0.4009	0.5520	0.1823	+54	-21
154 B. Capricorni	6.1	0.11	1.8	19 2.6	16 33.9	-2 31.2	+0.0753	0.5511	0.1894	+37	-38
161 B. Capricorni	6.4	0.17	1.9	18 20.2	21 15.7	+2 0.9	+0.2540	0.5500	0.1982	+47	-28
29 Aquarii (mean)	6.5	-0.18	-2.2	-17 23.9	21 23.1	+2 8.0	-0.6902	0.5500	+0.1984	-2	-90
145 G. Aquarii	6.5	0.29	1.9	17 12.0	3 8 13.3	-11 24.1	+1.3534	0.5476	0.2168	+73	+53
f Aquarii	6.3	0.29	1.9	17 12.0	8 13.5	-11 23.9	+1.3556	0.5476	0.2168	+73	+54
56 Aquarii	6.1	0.33	2.6	15 2.8	9 55.7	-9 45.3	-0.4820	0.5473	0.2195	+12	-72
69 Aquarii	5.6	0.41	2.5	14 31.9	17 49.7	-2 7.4	+0.7725	0.5459	0.2313	+71	-1
τ Aquarii	4.4	-0.42	-2.6	-14 4.1	18 41.2	-1 17.6	+0.4090	0.5458	+0.2325	+66	-16
74 Aquarii	5.8	0.45	3.2	12 5.8	20 27.8	+0 25.4	-1.0944	0.5455	0.2349	-23	-90
257 B. Aquarii	6.3	0.47	2.6	13 33.2	23 14.5	+3 6.4	+1.0460	0.5452	0.2386	+76	+16
290 B. Aquarii	6.3	0.55	3.1	11 10.7	4 6 8.0	+9 45.8	+0.3087	0.5445	0.2471	+56	-26
ψ Aquarii	4.5	0.56	3.6	9 34.7	6 40.7	+10 17.4	-1.1741	0.5444	0.2476	-28	-90
η Aquarii	4.6	-0.57	-3.5	-9 40.5	7 36.8	+11 11.7	-0.8446	0.5443	+0.2487	-5	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.												
MAY.												
THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle. <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m						
$\psi^3$ Aquarii	5.2	-0.57	-3.4	-10 6.2	4 8 5.7	+11 39.5	-0.2911	0.5443	+0.2493	+25	-59	
336 B. Aquarii	6.3	0.62	3.3	9 45.7	12 41.9	-7 53.5	+0.5225	0.5441	0.2541	+71	-15	
351 B. Aquarii	6.5	0.65	3.7	7 57.8	15 41.1	-5 0.4	-0.5250	0.5440	0.2570	+13	-75	
376 B. Aquarii	6.3	0.71	3.8	6 52.9	21 38.4	+0 44.9	-0.0644	0.5442	0.2622	+38	-40	
30 Piscium	4.7	0.77	3.7	6 30.9	5 3 46.6	+6 40.7	+1.1900	0.5446	0.2666	+83	+26	
33 Piscium	4.7	-0.78	-3.6	-6 12.7	5 19.3	+8 10.3	+1.2989	0.5447	+0.2676	+84	+38	
54 B. Ceti	6.3	0.87	4.2	2 43.1	14 3.2	-7 23.6	+0.1722	0.5460	0.2719	+52	-33	
14 Ceti	5.4	0.91	4.3	-1 0.1	19 3.6	-2 33.4	-0.1666	0.5471	0.2735	+34	-52	
33 Ceti	6.1	1.04	-4.1	+1 57.9	6 10 47.9	-11 21.5	+1.2155	0.5518	0.2740	+90	+28	
NEW MOON.												
118 Tauri	5.4	-1.14	-4.0	+25 4.8	10 19 8.2	-7 1.9	+0.2341	0.6023	+0.0894	+57	-10	
125 Tauri	5.1	1.10	4.5	25 50.9	23 2.0	-3 17.8	-0.2079	0.6025	0.0775	+31	-32	
139 Tauri	4.7	1.03	5.0	25 56.7	11 5 51.2	+3 14.2	+0.1517	0.6022	+0.0562	+52	-11	
37 Geminorum	5.7	0.75	6.1	25 29.4	12 3 28.3	-0 2.5	+1.1064	0.5956	-0.0110	+90	+48	
39 Geminorum	6.2	-0.73	+6.4	+26 12.1	4 47.8	+1 13.8	+0.3667	0.5949	-0.0150	+66	+4	
40 Geminorum	6.3	0.73	6.3	26 2.3	5 3.0	+1 28.3	+0.5287	0.5948	0.0157	+79	+12	
47 Geminorum	5.6	0.66	6.7	27 0.4	9 37.1	+5 51.3	-0.5612	0.5923	0.0294	+10	-50	
134 B. Geminorum	6.5	0.63	6.8	26 51.2	11 48.9	+7 57.7	-0.4776	0.5909	0.0359	+15	-45	
A Geminorum	5.1	0.59	6.4	25 13.6	14 20.5	+10 23.3	+1.0887	0.5893	0.0432	+90	+44	
v Geminorum	4.3	-0.52	+7.0	+27 5.9	19 11.6	-8 57.2	-1.0753	0.5860	-0.0571	-25	-63	
c Geminorum	5.5	0.47	6.8	26 0.0	22 27.2	-5 49.3	-0.1486	0.5836	0.0662	+34	-28	
$\kappa$ Geminorum	3.6	0.46	6.4	24 37.0	22 36.5	-5 40.4	+1.2668	0.5835	0.0666	+90	+61	
$\omega^2$ Cancrī	6.0	0.36	6.8	25 38.5	13 5 12.4	+0 40.1	-0.2873	0.5783	0.0842	+26	-37	
4 Cancrī	6.2	0.36	6.7	25 20.4	5 32.2	+0 59.1	-0.0028	0.5780	0.0851	+42	-22	
$\psi$ Cancrī	5.9	-0.31	+6.7	+25 47.0	9 5.1	+4 23.9	-0.7812	0.5750	-0.0942	-3	-64	
$\lambda$ Cancrī	5.9	0.24	6.3	24 18.5	13 15.6	+8 24.9	+0.3351	0.5715	0.1046	+63	-7	
28 Cancrī	6.1	0.19	6.3	24 26.8	16 37.5	+11 39.2	-0.1737	0.5685	0.1126	+33	-34	
$\nu^1$ Cancrī	5.7	0.17	6.3	24 23.2	17 50.6	-11 10.4	-0.2513	0.5674	0.1154	+28	-38	
$\iota^2$ Cancrī	6.4	-0.17	6.3	24 23.6	18 28.3	-10 34.1	-0.3310	0.5669	0.1169	+24	-43	
194 B. Cancrī	6.3	+0.05	+5.7	+23 20.7	14 9 21.6	+3 47.0	-1.2232	0.5530	-0.1488	-38	-67	
$\xi$ Cancrī	5.2	0.06	5.3	22 24.7	10 12.7	+4 36.4	-0.3672	0.5523	0.1505	+22	-48	
79 Cancrī	6.1	0.07	5.3	22 21.8	10 39.0	+5 1.7	-0.3832	0.5519	0.1513	+21	-49	
90 H' Cancrī	6.1	0.08	5.0	21 39.4	12 7.1	+6 26.8	+0.1397	0.5505	0.1541	+51	-21	
57 B. Leonis	6.5	0.26	3.7	19 16.7	15 2 15.6	-3 53.3	+0.3046	0.5376	0.1786	+61	-16	
$\eta$ Leonis	3.6	+0.39	+2.5	+17 12.2	13 9.2	+6 39.2	+0.4908	0.5283	-0.1945	+73	-9	
42 Leonis	6.1	0.46	1.6	15 25.8	20 16.7	-10 26.8	+0.0791	0.5226	0.2036	+90	+18	
46 Leonis	5.8	0.51	1.1	14 36.0	16 1 27.1	-5 26.0	+0.8074	0.5187	0.2095	+90	+6	
$\delta$ Leonis	5.5	0.59	+0.7	14 40.2	8 40.7	+1 34.5	-0.8099	0.5136	0.2169	-1	-75	
$\epsilon$ Leonis	4.1	0.77	-1.4	11 1.5	17 4 22.5	-3 17.9	-1.2880	0.5021	0.2324	-37	-79	
$\omega$ Virginis	5.4	+0.82	-2.6	+8 37.9	12 15.1	+4 21.4	-0.5210	0.4985	-0.2368	+15	-72	
$\nu$ Virginis	4.2	0.85	3.3	7 2.0	16 17.8	+8 17.4	+0.2698	0.4969	0.2387	+58	-27	
36 B. Virginis	6.5	0.92	4.0	6 3.6	18 2 10.5	-6 6.3	-1.0387	0.4937	0.2422	-14	-84	
$\epsilon$ Virginis	5.1	0.98	5.0	+3 48.7	11 27.0	+2 55.1	-0.8226	0.4916	0.2443	-1	-86	
46 Virginis	6.1	1.12	7.5	-2 53.2	19 10 5.9	+0 57.5	+1.0343	0.4899	0.2446	+87	+14	
48 Virginis	6.5	+1.13	-7.7	-3 10.9	11 58.0	+2 46.6	+0.9041	0.4900	-0.2443	+87	+6	
65 Virginis	6.0	1.20	8.2	4 27.4	22 54.2	-10 34.8	-0.3399	0.4911	0.2416	+24	-62	
66 Virginis	5.7	1.21	8.2	4 41.8	23 35.3	-9 54.8	-0.2392	0.4912	0.2414	+29	-56	
72 Virginis	6.1	1.23	8.6	6 0.5	20 2 53.2	-6 42.2	+0.4232	0.4917	0.2402	+66	-20	
$\iota$ Virginis	4.8	1.23	8.6	5 47.6	3 45.5	-5 51.3	-0.0244	0.4919	0.2399	+40	-44	
598 B. Virginis	6.1	+1.30	-9.0	-7 37.1	16 34.8	+6 37.1	-1.0370	0.4950	-0.2338	-16	-90	
623 B. Virginis	6.5	1.34	9.3	8 49.7	21 45.0	+11 38.9	-0.8944	0.4966	0.2307	-7	-90	
95 Virginis	5.4	1.34	9.3	8 53.2	23 3.0	-11 5.3	-1.1284	0.4971	0.2298	-24	-90	
96 Virginis	6.5	1.35	9.4	9 54.7	20 0 17.6	-9 52.8	-0.2756	0.4975	0.2290	+26	-58	
$\kappa$ Virginis	4.2	1.36	9.4	9 51.5	2 25.4	-7 48.5	-0.8210	0.4983	0.2275	-4	-90	
2 Libræ	6.3	+1.40	-9.7	-11 18.4	8 8.8	-2 14.7	-0.5017	0.5005	-0.2231	+13	-73	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		$\alpha$	$\delta$	$\alpha$	d h m	h m				$\alpha$	$\delta$
4 G. Libræ	6.5	+1.40	-9.6	-11 15.8	21 8 49.9	-1 34.7	-0.7010	0.5008	-0.2226	+2	-90
$\mu$ Libræ	5.4	1.47	9.8	13 46.6	22 0.2	+11 13.2	-0.7647	0.5068	0.2106	-3	-90
8 Libræ	5.4	1.48	10.0	15 37.6	22 42.3	+11 54.1	+1.1408	0.5071	0.2099	+74	+24
$\alpha^a$ Libræ	2.9	1.48	10.0	15 40.3	22 48.4	+12 0.0	+1.1693	0.5072	0.2098	+74	+27
$\nu$ Libræ	5.3	1.52	9.8	15 54.7	22 7 3.4	-3 59.2	-0.2588	0.5114	0.2007	+22	-57
22 Libræ	6.5	+1.52	-9.8	-16 8.3	7 9.3	-3 53.5	-0.0254	0.5116	-0.2005	+34	-44
26 Libræ	6.3	1.54	9.8	17 26.1	11 8.7	-0 1.2	+0.6219	0.5137	0.1958	+70	-9
28 Libræ	6.2	1.56	9.8	17 50.1	14 23.5	+3 7.9	+0.4352	0.5155	0.1918	+59	-19
11 H. Libræ	5.4	1.59	9.6	19 22.0	20 19.9	+8 53.5	+1.0175	0.5189	0.1838	+71	+16
41 Libræ	5.3	1.61	9.5	19 0.5	23 30.2	+11 58.1	+0.0441	0.5208	0.1793	+35	-40
$\kappa$ Libræ	5.0	+1.61	-9.4	-19 23.4	23 1 1.5	-10 33.4	+0.1955	0.5217	-0.1770	+43	-32
$\lambda$ Libræ	4.9	1.63	9.1	19 54.1	6 40.6	-5 4.7	-0.2154	0.5250	0.1685	+20	-55
47 Libræ	5.8	1.63	9.0	19 7.2	7 30.9	-4 16.0	-1.2201	0.5254	0.1672	-42	-90
10 G. Scorpii	5.9	1.65	9.0	20 43.5	8 48.1	-3 1.2	+0.3410	0.5262	0.1652	+49	-24
$\omega^a$ Scorpii	4.3	1.65	8.8	20 25.7	13 16.4	+1 18.7	-0.7087	0.5289	0.1579	-7	-90
$\omega^a$ Scorpii	4.6	+1.66	-8.8	-20 37.7	13 33.5	+1 35.2	-0.5324	0.5290	-0.1573	+3	-78
84 B. Scorpii	6.3	1.66	8.6	20 52.9	16 59.1	+4 54.4	-0.7818	0.5311	0.1515	-12	-90
51 G. Scorpii	6.5	1.67	8.5	21 5.0	18 11.1	+6 4.1	-0.7401	0.5318	0.1494	-10	-90
$\rho$ Ophiuchi	4.7	1.70	8.2	23 14.5	22 16.2	+10 1.4	+1.0476	0.5343	0.1421	+67	+20
126 B. Scorpii	6.1	1.72	7.6	24 17.8	24 5 49.9	-6 39.6	+1.1868	0.5387	0.1277	+66	+34
24 Ophiuchi	5.5	+1.72	-7.2	-23 0.6	12 55.8	+0 12.2	-1.0859	0.5426	-0.1136	-37	-90
88 B. Ophiuchi	6.3	1.74	6.9	24 57.5	14 21.2	+1 34.8	+0.8964	0.5434	0.1107	+65	+10
26 Ophiuchi	5.8	1.74	6.9	24 51.3	14 26.6	+1 40.0	+0.7724	0.5435	0.1104	+65	+2
137 B. Ophiuchi	6.3	1.74	6.4	25 8.8	19 58.7	+7 1.0	+0.5135	0.5464	0.0987	+52	-14
39 Ophiuchi	5.1	1.73	6.2	24 11.5	22 37.7	+9 34.6	-0.7886	0.5477	0.0929	-19	-90
$\theta$ Ophiuchi	3.3	+1.74	-6.0	-24 54.7	25 0 25.4	+11 18.6	-0.1610	0.5486	-0.0890	+14	-52
191 B. Ophiuchi	6.3	1.72	6.0	24 9.8	1 50.1	-11 19.6	-1.1049	0.5492	0.0858	-41	-90
$b$ Ophiuchi(var.)	4.4	1.72	6.0	24 5.7	2 24.5	-10 46.4	-1.2288	0.5495	0.0845	-54	-90
136 G. Ophiuchi	6.3	1.75	5.7	25 52.0	2 37.5	-10 33.9	+0.6942	0.5496	0.0840	+63	-3
151 G. Ophiuchi	6.0	1.75	5.5	26 12.2	4 47.2	-8 28.6	+0.8865	0.5505	0.0791	+64	+10
4 G. Sagittarii	6.2	+1.75	-4.7	-26 56.7	12 14.4	-1 16.9	+1.1706	0.5537	-0.0619	+63	+35
63 Ophiuchi	6.1	1.71	4.7	24 52.3	15 8.0	+1 30.7	-1.2646	0.5548	0.0550	-61	-90
66 B. Sagittarii	4.7	1.71	3.4	27 4.6	21 16.0	+11 17.3	+0.7086	0.5580	0.0303	+62	-2
67 B. Sagittarii	6.4	1.68	3.6	25 38.4	1 34.4	+11 35.0	-0.8649	0.5581	0.0296	-30	-90
68 G. Sagittarii	6.2	1.68	3.0	25 41.4	5 29.8	-8 37.9	+0.1807	0.5590	0.0198	+26	-32
$\lambda$ Sagittarii	2.9	+1.66	-3.3	-25 28.4	5 37.5	-8 30.5	-1.1447	0.5591	-0.0195	-50	-90
69 G. Sagittarii	6.3	1.69	3.0	26 48.7	5 39.4	-8 28.7	+0.3113	0.5591	0.0194	+33	-25
86 B. Sagittarii	6.5	1.68	3.0	26 38.4	6 17	-8 7.2	+0.1170	0.5592	0.0185	+22	-36
$\phi$ Sagittarii	3.3	1.65	2.1	27 5.1	13 16.1	-1 8.3	+0.5308	0.5605	-0.0003	+46	-12
$\sigma$ Sagittarii	2.3	1.62	1.9	26 24.6	17 26.3	+2 53.0	-0.1800	0.5610	+0.0103	+6	-53
201 B. Sagittarii	5.9	+1.56	-1.1	-26 3.5	27 1 11.9	+10 21.9	-0.4024	0.5615	+0.0300	-4	-69
$\psi$ Sagittarii	4.8	1.55	1.2	25 24.8	2 12.3	+11 20.2	-1.0681	0.5615	0.0326	-43	-90
248 B. Sagittarii	5.7	1.52	0.1	27 10.2	8 21.3	-6 44.1	+1.0757	0.5614	0.0482	+63	+25
51 Sagittarii	5.8	1.47	0.4	24 55.0	11 3.0	-4 8.3	-1.2117	0.5612	0.0550	-54	-90
$\kappa$ Sagittarii	4.7	1.47	-0.3	25 5.0	11 20.2	-3 51.7	-0.0168	0.5612	0.0557	-37	-90
$\omega$ Sagittarii	4.8	+1.42	+0.9	-25 32.3	19 34.3	+4 4.6	+1.0903	0.5603	+0.0762	+63	+26
$A$ Sagittarii	4.9	1.40	1.0	26 26.4	20 55.8	+5 23.2	+1.0892	0.5601	0.0795	+64	+26
40 B. Capricorni	6.2	1.24	2.0	25 14.9	11 42.7	-4 21.5	+1.2479	0.5570	0.1148	+65	+44
56 B. Capricorni	6.3	1.21	2.2	24 6.2	14 54.9	-1 16.1	+0.4073	0.5561	0.1222	+48	-20
86 B. Capricorni	6.2	1.14	2.5	24 7.2	20 34.8	+4 11.8	+1.1521	0.5544	0.1349	+66	+30
$\chi$ Capricorni	5.3	+1.03	+2.3	-21 33.3	29 3 30.2	+10 52.8	-0.5805	0.5522	+0.1498	-1	-83
27 Capricorni	6.1	1.02	2.1	20 55.1	3 56.8	+11 18.4	-1.1878	0.5521	0.1508	-42	-90
$\phi$ Capricorni	5.3	0.99	2.4	21 1.5	6 39.6	-10 4.4	-0.6564	0.5512	0.1564	-5	-90
33 Capricorni	5.3	0.94	2.7	21 14.0	10 28.4	-6 23.6	+0.1758	0.5499	0.1642	+39	-33
35 Capricorni	6.0	0.93	2.9	21 35.1	11 51.4	-5 3.5	+0.7750	0.5494	0.1668	+68	+1
128 B. Capricorni	6.5	+0.90	+2.4	-19 32.4	13 6.6	-3 50.8	-1.1685	0.5489	+0.1693	-38	-90

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
37 Capricorni	5.7	+0.88	+2.8	-20 29.1	29 15 17.5	- 1 44.4	+0.2004	0.5481	+0.1736	+42	-32
$\epsilon$ Capricorni	4.7	0.86	2.7	19 52.1	16 18.1	- 0 45.9	-0.2712	0.5478	0.1755	+17	-58
$\kappa$ Capricorni	4.8	0.84	2.7	19 16.6	18 49.4	+ 1 40.3	-0.4450	0.5470	0.1802	+ 9	-70
143 B. Capricorni	6.1	0.84	3.0	20 1.9	19 4.6	+ 1 54.9	+0.3937	0.5469	0.1807	+53	-21
154 B. Capricorni	6.1	0.78	2.9	19 2.5	22 55.7	+ 5 38.2	+0.0652	0.5456	0.1877	+36	-39
161 B. Capricorni	6.4	+0.72	+2.9	-18 20.1	30 3 43.7	+10 16.3	+0.2467	0.5440	+0.1962	+47	-29
29 Aquarii ( <i>mean</i> )	6.5	0.71	2.6	17 23.9	3 51.2	+10 23.6	-0.7084	0.5440	0.1963	- 3	-90
145 G. Aquarii	6.5	0.58	3.3	17 11.9	14 57.3	- 2 52.6	+1.3623	0.5406	0.2142	+73	+57
$f$ Aquarii	6.3	0.58	3.3	17 12.0	14 57.5	- 2 52.4	+1.3645	0.5406	0.2142	+73	+58
56 Aquarii	6.1	0.54	2.6	15 2.7	16 42.3	- 1 11.2	-0.4907	0.5401	0.2168	+11	-74
69 Aquarii	5.6	+0.44	+2.9	-14 31.8	31 0 49.4	+ 6 39.9	+0.7761	0.5381	+0.2281	+70	- 1
$\tau$ Aquarii	4.4	0.42	2.8	14 4.0	1 42.4	+ 7 31.2	+0.4989	0.5379	0.2293	+66	-16
74 Aquarii	5.8	0.39	2.2	12 5.7	3 32.1	+ 9 17.3	-1.1165	0.5375	0.2316	-25	-90
257 B. Aquarii	6.3	0.36	2.9	13 33.1	6 23.8	-11 56.7	+1.0549	0.5369	0.2352	+76	+17
290 B. Aquarii	6.3	0.27	2.4	11 10.6	13 29.8	- 5 4.7	+0.3082	0.5357	0.2432	+56	-26
$\psi^1$ Aquarii	4.5	+0.26	+1.8	- 9 34.7	14 3.6	- 4 32.0	-1.1966	0.5356	+0.2439	-30	-90
$\psi^2$ Aquarii	4.6	0.24	1.9	9 40.4	15 1.5	- 3 35.9	-0.8621	0.5355	0.2449	- 6	-90
$\psi^3$ Aquarii	5.2	0.24	2.1	10 6.1	15 31.3	- 3 7.2	-0.3001	0.5355	0.2454	+24	-60
336 B. Aquarii	6.3	0.18	2.2	9 45.6	20 16.4	+ 1 28.6	+0.5264	0.5350	0.2500	+71	-15
351 B. Aquarii	6.5	0.14	1.7	7 57.7	23 21.4	+ 4 27.6	-0.5365	0.5348	0.2528	+13	-76

JUNE.

376 B. Aquarii	6.3	+0.06	+1.6	- 6 52.8	1 5 30.6	+10 24.8	-0.0681	0.5346	+0.2577	+38	-46
30 Piscium	4.7	-0.01	1.8	6 30.8	11 51.3	- 7 26.9	+1.2071	0.5349	0.2620	+83	+27
33 Piscium	4.7	-0.03	+1.8	- 6 12.6	13 27.2	- 5 54.1	+1.3179	0.5350	+0.2629	+84	+39
54 B. Ceti	6.3	0.15	1.0	2 43.0	22 29.1	+ 2 50.1	+0.1746	0.5362	0.2671	+52	-33
14 Ceti	5.4	0.20	0.6	- 1 0.0	2 39.7	+ 7 50.5	-0.1690	0.5373	0.2687	+34	-52
33 Ceti	6.1	0.38	0.5	+ 1 58.0	19 55.5	- 0 25.9	+1.2350	0.5424	0.2695	+90	+30
$f$ Piscium	5.1	0.42	+0.3	3 8.4	23 14.6	+ 2 46.4	+0.9537	0.5438	0.2687	+90	+ 9
$\mu$ Piscium	5.0	-0.48	-0.2	+ 5 40.8	3 4 51.3	+ 8 11.7	-0.0769	0.5464	+0.2669	+38	-46
$\sigma$ Piscium	4.4	0.56	0.6	8 42.3	11 41.8	- 9 11.8	-1.2700	0.5500	0.2636	-34	-81
VENUS				9 45.1	19 43.9	- 1 26.5	-0.2107	0.5122	0.2429	+32	-52
SATURN				10 2.5	21 31.7	+ 0 17.5	-0.0367	0.5517	0.2551	+41	-42
31 Arietis	5.7	0.75	0.1	12 3.5	4 10 2.5	-11 38.6	+1.0974	0.5642	0.2431	+90	+24
$\alpha$ Arietis	5.8	-0.80	-0.4	+14 55.9	13 22.8	- 8 25.6	-0.9366	0.5666	+0.2387	- 9	-75
$\sigma$ Arietis	5.5	0.82	0.2	14 42.7	16 18.1	- 5 36.7	-0.0284	0.5687	0.2346	+41	-38
124 B. Arietis	6.4	0.84	-0.4	16 7.0	16 59.8	- 4 56.6	-1.2525	0.5692	+0.2336	-35	-74

NEW MOON.

134 B. Geminorum	6.5	-0.75	+6.2	+26 51.2	8 21 45.0	- 4 18.1	-0.4949	0.5987	-0.0367	+14	-46
$\delta$ Geminorum	5.1	0.72	6.1	25 13.6	9 0 13.3	- 1 56.0	+1.0555	0.5973	0.0441	+90	+42
$\nu$ Geminorum	4.3	0.67	6.6	27 5.9	4 57.6	+ 2 36.7	-1.0886	0.5942	0.0582	-26	-03
$\epsilon$ Geminorum	5.5	0.63	6.5	26 0.0	8 8.6	+ 5 40.0	-0.1724	0.5920	0.0674	+32	-29
$\kappa$ Geminorum	3.6	0.63	6.2	24 37.0	8 17.7	+ 5 48.8	+1.2282	0.5918	0.0678	+90	+56
$\omega^1$ Cancri	6.0	-0.55	+6.6	+25 38.5	14 43.7	+11 59.3	-0.3116	0.5868	-0.0858	+25	-39
4 Cancri	6.2	0.55	6.5	25 20.4	15 3.0	-11 42.1	-0.0304	0.5865	0.0867	+41	-23
$\psi$ Cancri	5.9	0.51	6.6	25 47.0	18 30.6	- 8 22.7	-0.8013	0.5836	0.0959	- 4	-64
$\lambda$ Cancri	5.9	0.46	6.4	24 18.5	22 34.6	- 4 28.2	+0.3009	0.5800	0.1064	+61	- 8
28 Cancri	6.1	0.42	6.5	24 26.8	10 1 51.2	- 1 19.1	-0.2031	0.5771	0.1147	+31	-35
$\nu^1$ Cancri	5.7	-0.41	+6.5	+24 23.2	3 2.4	- 0 10.6	-0.2803	0.5760	-0.1176	+27	-40
$\nu^2$ Cancri	6.4	0.40	6.5	24 23.6	3 39.1	+ 0 24.7	-0.3592	0.5754	0.1191	+22	-44
194 B. Cancri	6.3	0.22	6.2	23 20.7	18 8.9	- 9 37.7	-1.2458	0.5614	0.1514	-41	-67
$\epsilon$ Cancri	5.2	0.21	6.0	22 24.7	18 58.5	- 8 49.9	-0.4003	0.5605	0.1530	+20	-51
79 Cancri	6.1	0.20	6.0	22 21.8	19 24.2	- 8 25.1	-0.4164	0.5601	0.1538	+20	-51
90 H. Cancri	6.1	-0.19	+5.7	+21 39.4	20 50.0	- 7 2.4	+0.0908	0.5587	-0.1568	+48	-24

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.		
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.			
		$\Delta\alpha$	$\Delta\delta$											
		s	"	°	d	h	m	h	m					
57 B. Leonis	6.5	-0.02	+ 4.8	+19 16.7	11	10	36.6	+ 6	15.4	+0.2580	0.5451	-0.1814	+58	-19
<i>η</i> Leonis	3.6	+0.09	3.8	17 12.2	21	14.2	- 7	28.1	+0.4387	0.5351	0.1972	+70	-12	
42 Leonis	6.1	0.17	3.0	15 25.8	12	4	11.7	- 0	44.0	+0.9198	0.5289	0.2062	+90	+14
46 Leonis	5.8	0.22	2.6	14 36.0	9	15.3	+ 4	10.0	+0.7488	0.5246	0.2120	+90	+ 3	
<i>k</i> Leonis	5.5	0.30	2.4	14 40.2	16	19.8	+11	1.4	-0.8536	0.5189	0.2193	- 4	-75	
<i>ι</i> Leonis	4.1	+0.50	+ 0.4	+11 1.5	13	11	40.3	+ 5	47.5	-1.3328	0.5058	-0.2342	-42	-79
<i>ω</i> Virginis	5.4	0.56	- 0.7	8 37.9	19	25.9	-10	40.2	-0.5739	0.5016	0.2382	+13	-75	
<i>ν</i> Virginis	4.2	0.59	1.5	7 2.0	23	25.4	- 6	47.5	+0.2101	0.4997	0.2401	+54	-30	
36 B. Virginis	6.5	0.68	2.1	6 3.6	14	9	11.0	+ 2	41.8	-1.0901	0.4957	0.2432	-18	-84
<i>c</i> Virginis	5.1	0.76	3.2	+ 3 48.8	18	22.2	+11	37.9	-0.8764	0.4930	0.2450	- 4	-86	
46 Virginis	6.1	+0.95	- 6.1	- 2 53.2	15	16	52.5	+ 9	31.7	+0.9737	0.4900	-0.2444	+87	+10
48 Virginis	6.5	0.96	6.3	3 10.8	18	44.1	+11	20.3	+0.8445	0.4899	0.2441	+87	+ 2	
65 Virginis	6.0	1.06	6.9	4 27.3	16	5	38.2	- 2	3.3	-0.3926	0.4905	0.2412	+22	-65
66 Virginis	5.7	1.07	7.0	4 41.7	6	19.3	- 1	23.3	-0.2920	0.4906	0.2409	+26	-59	
72 Virginis	6.1	1.10	7.4	6 0.5	9	36.7	+ 1	48.9	+0.3691	0.4911	0.2396	+63	-23	
<i>l</i> Virginis	4.8	+1.10	- 7.4	- 5 47.6	10	29.0	+ 2	39.7	-0.0768	0.4912	-0.2393	+37	-47	
<i>m</i> Virginis	5.4	1.14	8.2	8 15.1	15	51.2	+ 7	53.2	+1.3657	0.4922	0.2370	+82	+46	
598 B. Virginis	6.1	1.21	8.1	7 37.1	23	17.4	- 8	52.8	-1.0830	0.4941	0.2330	-20	-90	
623 B. Virginis	6.5	1.26	8.4	8 49.7	17	4	27.4	- 3	51.2	-0.9388	0.4956	0.2298	-10	-90
95 Virginis	5.4	1.27	8.4	8 53.2	5	45.4	- 2	35.4	-1.1719	0.4961	0.2290	-27	-90	
96 Virginis	6.5	+1.29	- 8.7	- 9 54.7	7	0.0	- 1	22.8	-0.3205	0.4966	-0.2281	+23	-61	
<i>κ</i> Virginis	4.2	1.31	8.7	9 51.5	9	7.7	+ 0	41.4	-0.8638	0.4973	0.2267	- 6	-90	
2 Libræ	6.3	1.36	9.1	11 18.4	14	51.1	+ 6	15.2	-0.5426	0.4995	0.2222	+11	-76	
4 G. Libræ	6.5	1.36	9.1	11 15.8	15	32.2	+ 6	55.2	-0.7412	0.4997	0.2217	0	-90	
<i>μ</i> Libræ	5.4	1.48	9.6	13 46.6	18	4	42.4	- 4	17.0	-0.7984	0.5058	0.2097	- 5	-90
8 Libræ	5.4	+1.50	-10.0	-15 37.6	5	24.5	- 3	36.1	+1.1037	0.5062	-0.2089	+74	+21	
<i>α</i> Libræ	2.9	1.50	10.0	15 40.3	5	30.6	- 3	30.2	+1.1323	0.5062	0.2088	+74	+24	
<i>ν</i> Libræ	5.3	1.57	9.8	15 54.7	13	45.5	+ 4	30.4	-0.2886	0.5107	0.1999	+21	-59	
22 Libræ	6.5	1.57	9.9	16 8.3	13	51.4	+ 4	36.1	-0.0556	0.5107	0.1997	+33	-45	
26 Libræ	6.3	1.62	10.0	17 26.1	17	50.6	+ 8	28.2	+0.5928	0.5130	0.1950	+68	-10	
28 Libræ	6.2	+1.65	-10.0	-17 50.1	21	5.2	+11	37.1	+0.4084	0.5149	-0.1910	+57	-21	
11 H. Libræ	5.4	1.71	10.0	19 22.0	19	3	1.1	- 6	37.7	+0.9931	0.5185	0.1831	+71	+14
41 Libræ	5.3	1.74	9.8	19 0.5	6	11.2	- 3	33.4	+0.0238	0.5205	0.1785	+34	-41	
<i>κ</i> Libræ	5.0	1.75	9.8	19 23.4	7	42.3	- 2	5.0	+0.1759	0.5214	0.1764	+42	-33	
<i>λ</i> Libræ	4.9	1.80	9.6	19 54.1	13	20.6	+ 3	22.9	-0.2306	0.5251	0.1679	+20	-56	
47 Libræ	5.8	+1.80	- 9.4	-19 7.2	14	10.8	+ 4	11.5	-1.2324	0.5256	-0.1665	-44	-90	
10 G. Scorpïi	5.9	1.82	9.6	20 43.5	15	27.8	+ 5	26.1	+0.3261	0.5264	0.1645	+48	-25	
<i>ω</i> Scorpïi	4.3	1.85	9.3	20 25.7	19	55.3	+ 9	45.2	-0.7181	0.5294	0.1573	- 8	-90	
<i>ω</i> Scorpïi	4.6	1.86	9.3	20 37.7	20	12.4	+10	1.7	-0.5421	0.5296	0.1568	+ 2	-79	
84 B. Scorpïi	6.3	1.89	9.1	20 52.9	23	37.3	-10	39.8	-0.7885	0.5318	0.1510	-12	90	
51 G. Scorpïi	6.5	+1.90	- 9.0	-21 5.0	20	0	49.0	- 9	30.5	-0.7460	0.5326	-0.1488	-10	-90
<i>ρ</i> Ophiuchi	4.7	1.95	9.0	23 14.5	4	53.1	- 5	34.2	+1.0400	0.5351	0.1416	+67	+20	
126 B. Scorpïi	6.1	2.02	8.5	24 17.8	12	24.6	+ 1	42.5	+1.1840	0.5399	0.1274	+66	+34	
24 Ophiuchi	5.5	2.05	7.8	23 0.6	19	28.2	+ 8	32.1	-1.0769	0.5443	0.1132	-36	-90	
88 B. Ophiuchi	6.3	2.08	7.8	24 57.5	20	53.0	+ 9	54.0	+0.9004	0.5452	0.1103	+65	+10	
26 Ophiuchi	5.8	+2.08	- 7.8	-24 51.3	20	58.4	+ 9	59.2	+0.7768	0.5452	-0.1100	+65	+ 2	
137 B. Ophiuchi	6.3	2.12	7.2	25 8.8	21	2	28.3	8	41.9	+0.5228	0.5483	0.0983	+53	-13
39 Ophiuchi	5.1	2.11	6.9	24 11.5	5	6.2	- 6	9.5	-0.7731	0.5498	0.0925	-18	-90	
<i>η</i> Ophiuchi	3.3	2.14	6.7	24 54.7	6	53.1	4	26.2	-0.1461	0.5508	0.0886	+15	-51	
191 B. Ophiuchi	6.3	2.13	6.5	24 9.8	8	17.2	- 3	4.9	-1.0857	0.5515	0.0854	-40	-90	
<i>b</i> Ophiuchi (var.)	4.4	+2.13	- 6.5	-24 5.7	8	51.3	- 2	32.0	-1.2086	0.5518	0.0841	-51	-90	
136 G. Ophiuchi	6.3	2.16	6.5	25 52.0	9	4.2	- 2	19.6	+0.7078	0.5519	0.0836	+64	- 2	
151 G. Ophiuchi	6.0	2.18	6.3	26 12.2	11	12.9	- 0	15.4	+0.9011	0.5531	0.0787	+64	+11	
4 G. Sagittarii	6.2	2.22	5.4	26 56.7	18	36.4	+ 6	52.7	+1.1898	0.5566	0.0614	+63	+38	
63 Ophiuchi	6.1	2.19	5.1	24 52.3	21	28.4	+ 9	38.6	-1.2342	0.5578	0.0545	-57	-90	
66 B. Sagittarii	4.7	+2.26	- 3.8	-27 4.6	22	7	30.8	- 4	40.5	+0.7394	0.5614	-0.0297	+63	0

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	°	d h m	h m				°	°
67 B. Sagittarii	6.4	+2.23	-3.8	-25 38.4	22 7 49.0	-4 22.9	-0.8277	0.5615	-0.0289	-28	-90
68 G. Sagittarii	6.2	2.26	3.2	26 41.4	11 42.0	-0 38.3	+0.2169	0.5625	0.0191	+28	-30
λ Sagittarii	2.9	2.23	3.3	25 28.4	11 49.7	-0 30.9	-1.1032	0.5625	0.0188	-47	-90
69 G. Sagittarii	6.3	2.26	3.2	26 48.8	11 51.6	-0 29.0	+0.3470	0.5625	0.0187	+35	-23
86 B. Sagittarii	6.5	2.25	3.2	26 38.4	12 13.7	-0 7.7	+0.1539	0.5626	-0.0178	+24	-34
φ Sagittarii	3.3	+2.27	-2.2	-27 5.1	19 23.7	+6 46.8	+0.5711	0.5642	+0.0006	+49	-10
σ Sagittarii	2.3	2.25	1.6	26 24.6	23 31.3	+10 45.5	-0.1329	0.5648	0.0112	+8	-50
201 B. Sagittarii	5.9	2.23	0.6	26 3.5	23 7 12.1	-5 50.5	-0.3482	0.5655	0.0311	-1	-65
ψ Sagittarii	4.8	2.22	-0.5	25 24.8	8 11.8	-4 53.1	-1.0107	0.5655	0.0336	-39	-90
248 B. Sagittarii	5.7	2.24	+0.5	27 10.2	14 17.0	+0 58.9	+1.1304	0.5655	0.0494	+63	+31
51 Sagittarii	5.8	+2.18	+0.7	-24 55.0	16 57.1	+3 33.2	-1.1469	0.5653	+0.0562	-48	-90
h Sagittarii	4.7	2.19	0.7	25 5.0	17 14.1	+3 49.5	-0.9523	0.5652	0.0569	-33	-90
ω Sagittarii	4.8	2.19	2.1	26 32.3	21 23.4	+11 41.1	+1.1546	0.5642	0.0776	+63	+33
A Sagittarii	4.9	2.17	2.2	26 26.3	2 44.0	-11 1.2	+1.1547	0.5640	0.0809	+64	+33
56 B. Capricorni	6.3	2.04	4.5	24 6.1	20 34.0	+6 10.4	+0.4897	0.5594	0.1237	+53	-15
86 B. Capricorni	6.2	+1.98	+5.0	-24 7.2	25 2 11.6	+11 36.0	+1.2381	0.5574	+0.1363	+66	+41
χ Capricorni	5.3	1.87	5.2	21 33.3	9 4.6	-5 45.5	-0.4871	0.5548	0.1512	+4	-74
27 Capricorni	6.1	1.87	5.2	20 55.0	9 31.1	-5 19.9	-1.0936	0.5546	0.1522	-34	-90
φ Capricorni	5.3	1.84	5.6	21 1.4	12 13.2	-2 43.5	-0.5608	0.5536	0.1578	0	-80
33 Capricorni	5.3	1.81	6.0	21 14.0	16 1.2	+0 56.5	+0.2741	0.5520	0.1654	+45	-27
35 Capricorni	6.0	+1.80	+6.3	-21 35.1	17 23.9	+2 16.4	+0.8744	0.5514	+0.1682	+68	+7
128 B. Capricorni	6.5	1.76	5.9	19 32.3	18 38.9	+3 28.8	-1.0686	0.5509	0.1706	-29	-90
37 Capricorni	5.7	1.75	6.4	20 29.0	20 49.5	+5 34.9	+0.3023	0.5500	0.1748	+47	-26
ε Capricorni	4.7	1.73	6.3	19 52.1	21 50.0	+6 33.3	-0.1689	0.5496	0.1767	+23	-52
κ Capricorni	4.8	1.71	6.5	19 16.5	26 0 21.0	+8 59.2	-0.3411	0.5485	0.1813	+14	-63
143 B. Capricorni	6.1	+1.71	+6.7	-20 1.8	0 36.2	+9 13.9	+0.4985	0.5484	+0.1819	+60	-15
154 B. Capricorni	6.1	1.66	6.8	19 2.4	4 27.2	-11 3.0	+0.1725	0.5468	0.1888	+42	-33
161 B. Capricorni	6.4	1.60	7.1	18 20.0	9 15.4	-6 24.6	+0.3576	0.5448	0.1970	+53	-23
29 Aquarii (mean)	6.5	1.58	6.9	17 23.8	9 22.9	-6 17.3	-0.5995	0.5447	0.1972	+3	-83
56 Aquarii	6.1	1.42	7.3	15 2.6	22 16.5	+6 10.5	-0.3802	0.5396	0.2171	+17	-65
69 Aquarii	5.6	+1.33	+7.9	-14 31.7	27 6 26.8	-9 55.4	+0.9026	0.5367	+0.2280	+75	+7
τ Aquarii	4.4	1.31	7.8	14 3.9	7 20.3	-9 3.7	+0.6246	0.5364	0.2291	+73	-9
74 Aquarii	5.8	1.27	7.3	12 5.6	9 10.9	-7 16.7	-0.9985	0.5358	0.2313	-16	-90
257 B. Aquarii	6.3	1.25	8.0	13 33.0	12 4.2	-4 29.0	+1.1862	0.5349	0.2347	+76	+27
290 B. Aquarii	6.3	1.16	7.7	11 10.5	19 15.0	+2 27.9	+0.4383	0.5330	0.2423	+64	-20
ψ <sup>1</sup> Aquarii	4.5	+1.15	+7.2	-9 34.6	19 49.2	+3 1.0	-1.0766	0.5329	+0.2429	-20	-90
ψ <sup>2</sup> Aquarii	4.6	1.13	7.3	9 40.3	20 47.8	+3 57.7	-0.7396	0.5327	0.2439	+1	-90
ψ <sup>3</sup> Aquarii	5.2	1.12	7.5	10 6.1	21 18.0	+4 26.9	-0.1735	0.5326	0.2443	+31	-52
336 B. Aquarii	6.3	1.07	7.7	9 45.5	28 2 6.9	+9 6.5	+0.6606	0.5316	0.2486	+79	-8
351 B. Aquarii	6.5	1.02	7.3	7 57.6	5 14.8	-11 51.5	-0.4102	0.5311	0.2512	+20	-66
376 B. Aquarii	6.3	+0.94	+7.3	-6 52.7	11 30.2	-5 48.1	+0.0532	0.5303	+0.2558	+45	-39
30 Piscium	4.7	0.86	7.5	6 30.7	17 57.9	+0 27.2	+1.3516	0.5299	0.2596	+83	+43
54 B. Ceti	6.3	0.71	6.7	2 42.9	29 4 49.3	+10 57.8	+0.3087	0.5302	0.2640	+60	-26
14 Ceti	5.4	0.65	6.3	-0 59.9	10 7.3	-7 54.3	-0.0396	0.5308	0.2653	+40	-45
33 Ceti	6.1	0.45	6.0	+1 58.1	30 2 48.7	+8 14.8	+1.3777	0.5346	0.2653	+90	+48
f Piscium	5.1	+0.40	+5.7	+3 8.5	6 13.5	+11 32.8	+1.0912	0.5358	+0.2643	+90	+18
μ Piscium	5.0	0.34	5.0	5 40.9	12 0.0	-6 52.0	+0.0435	0.5381	0.2623	+45	-39
o Piscium	4.4	+0.25	4.3	8 42.4	19 2.8	-0 3.2	-1.1712	0.5413	0.2589	-25	-81

JULY.

31 SATURN				+10 49.7	1 9 37.2	-9 58.4	+0.3908	0.5466	+0.2466	+65	-19
o Arietis	5.7	0.00	+4.0	12 3.5	18 4.9	-1 48.3	+1.2112	0.5551	0.2383	+90	+33
σ Arietis	5.8	-0.05	3.3	14 55.9	21 31.4	+1 30.8	-0.8560	0.5575	0.2340	-4	-75
124 B. Arietis	5.5	0.08	3.4	14 42.8	2 0 32.1	+4 25.1	+0.0625	0.5597	0.2299	+46	-33
145 B. Arietis	6.4	0.09	3.0	16 7.0	1 15.0	+5 6.4	-1.1801	0.5602	0.2289	-28	-74
	6.5	-0.13	+3.4	+15 30.5	6 10.8	+9 51.5	+0.5412	0.5638	+0.2216	+77	-8

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
53 Arietis	6.0	-0.15	+2.9	+17 32.0	2 7 19.6	+10 57.8	-1.2330	0.5647	+0.2198	-34	-72
175 B. Arietis	6.4	0.23	3.0	18 26.6	15 33.0	-5 6.9	-0.3891	0.5709	0.2058	+21	-55
26 B. Tauri	6.4	0.25	3.2	17 32.3	18 29.5	-2 17.1	+1.1114	0.5732	0.2003	+90	+30
13 Tauri	5.6	0.29	3.0	19 24.8	21 49.6	+0 55.5	-0.1042	0.5758	0.1938	+37	-38
14 Tauri	6.2	0.29	3.0	19 22.9	22 25.4	+1 29.9	+0.0424	0.5762	0.1926	+45	-30
22 H. Tauri	6.1	-0.30	+2.8	+20 38.7	22 41.3	+1 45.2	-1.1691	0.5764	+0.1921	-30	-69
.4' Tauri	4.6	0.36	2.8	21 50.2	3 6 49.8	+9 34.9	-0.8649	0.5825	0.1746	-6	-68
39 Tauri	6.1	0.36	2.8	21 46.0	7 5.1	+9 49.7	-0.7506	0.5827	0.1740	0	-68
192 B. Tauri	6.1	0.39	2.9	22 11.0	10 4.5	-11 17.9	-0.6559	0.5849	0.1671	+6	-66
51 Tauri	5.6	0.40	3.2	21 21.6	12 16.3	-9 11.4	+0.5268	0.5864	0.1619	+77	-2
53 Tauri	5.3	-0.40	+3.3	+20 55.6	12 41.6	-8 47.0	+1.0290	0.5867	+0.1609	+90	+28
56 Tauri	5.2	0.40	3.2	21 33.5	12 45.2	-8 43.6	+0.4082	0.5867	0.1607	+68	-8
$\kappa$ Tauri	4.1	0.42	3.2	22 5.4	15 0.3	-6 33.8	+0.2327	0.5883	0.1552	+56	-16
67 Tauri	5.4	0.42	3.2	21 59.7	15 1.6	-6 32.5	+0.3295	0.5883	0.1551	+62	-11
$\nu$ Tauri	4.2	0.42	3.1	22 36.7	15 21.9	-6 13.1	-0.2323	0.5885	0.1543	+30	-40
72 Tauri	5.4	-0.43	+3.1	+22 47.7	15 45.1	-5 50.8	-0.3567	0.5888	+0.1533	+23	-47
247 B. Tauri	5.8	0.42	3.4	21 25.2	16 3.1	-5 33.6	+1.0618	0.5890	0.1526	+90	+32
284 B. Tauri	6.0	0.45	3.2	23 9.5	19 19.7	-2 24.8	-0.1876	0.5911	0.1442	+32	-37
$\tau$ Tauri	4.5	0.47	3.4	22 47.2	21 34.2	-0 15.7	+0.5012	0.5925	0.1383	+76	-1
95 Tauri	6.2	0.47	3.2	23 55.2	21 55.9	+0 5.1	-0.5816	0.5928	0.1374	+10	-59
300 B. Tauri	6.2	-0.48	+3.3	+23 27.9	22 53.8	+1 0.7	+0.0045	0.5933	+0.1348	+43	-26
315 B. Tauri	6.3	0.50	3.3	24 27.0	2 56.2	+4 53.2	-0.4577	0.5956	0.1238	+17	-50
99 Tauri	6.0	0.50	3.5	23 48.6	3 32.3	+5 27.9	+0.2564	0.5959	0.1221	+58	-12
$\lambda$ Tauri	5.6	0.51	3.3	24 54.8	3 39.2	+5 34.5	-0.8325	0.5960	+0.1218	-6	-65
NEW MOON.											
$\xi$ Cancr	5.2	-0.27	+5.7	+22 24.7	8 4 38.1	+2 37.8	-0.5052	0.5656	-0.1556	+14	-57
79 Cancr	6.1	0.27	5.7	22 21.8	5 3.4	+3 2.1	-0.5216	0.5652	0.1565	+14	-58
90 H. Cancr	6.1	0.26	5.6	21 39.4	6 27.9	+4 23.6	-0.0103	0.5639	0.1594	+42	-30
57 B. Leonis	6.5	0.15	5.0	19 16.7	20 1.9	-6 31.2	+0.1285	0.5508	0.1844	+50	-25
$\eta$ Leonis	3.6	-0.07	+4.3	+17 12.2	9 6 28.7	+3 34.4	+0.2945	0.5410	-0.2005	+60	-19
42 Leonis	6.1	-0.01	3.8	15 25.8	13 18.8	+10 11.0	+0.7634	0.5348	0.2095	+90	+4
46 Leonis	5.8	+0.03	3.4	14 36.0	18 16.9	-9 0.5	+0.5878	0.5305	0.2153	+81	-6
$\lambda$ Leonis	5.5	0.09	3.2	14 40.3	10 1 13.7	-2 16.8	-1.0094	0.5247	0.2226	-14	-75
$\omega$ Virginis	5.4	0.31	+0.6	8 38.0	11 3 50.9	-0 27.4	-0.7560	0.5064	0.2411	+3	-78
$\nu$ Virginis	4.2	+0.34	-0.1	+7 2.0	7 46.4	+3 21.4	+0.0195	0.5043	-0.2427	+43	-40
$\delta$ Virginis	5.2	0.40	1.2	4 9.4	15 19.5	+10 41.6	+1.2936	0.5007	0.2451	+90	+36
36 B. Virginis	6.5	0.42	0.6	6 3.7	17 22.8	-11 18.6	-1.2769	0.4999	0.2456	-34	-84
$\epsilon$ Virginis	5.1	0.50	1.7	+3 48.8	12 2 26.1	-2 30.4	-1.0689	0.4965	0.2470	-16	-86
$\gamma$ Virginis (mean)	2.9	0.58	3.6	-0 57.4	14 11.4	+8 55.5	+1.2332	0.4935	0.2471	+89	+30
$\lambda$ Virginis	5.7	+0.68	-4.7	-3 19.7	18 0 9.2	-5 23.0	+1.3805	0.4921	-0.2456	+87	+48
46 Virginis	6.1	0.69	4.5	2 53.2	0 40.7	-4 52.4	+0.7666	0.4921	0.2455	+87	-2
48 Virginis	6.5	0.71	4.7	3 10.8	2 31.2	-3 4.9	+0.6382	0.4920	0.2450	+83	-9
65 Virginis	6.0	0.82	5.4	4 27.3	13 19.9	+7 26.2	-0.5913	0.4919	0.2416	+11	-80
66 Virginis	5.7	0.83	5.5	4 41.7	14 0.6	+8 5.8	-0.4909	0.4920	0.2413	+16	-72
72 Virginis	6.1	+0.85	-6.0	-6 0.5	17 16.7	+11 16.6	+0.1684	0.4922	-0.2400	+51	-34
$\iota$ Virginis	4.8	0.86	6.0	5 47.6	18 8.6	-11 52.9	-0.2754	0.4923	0.2396	+27	-58
$m$ Virginis	5.4	0.90	6.9	8 15.1	23 28.9	-6 41.3	+1.1639	0.4930	0.2370	+82	+24
598 B. Virginis	6.1	0.98	6.8	7 37.1	14 6 52.8	+0 30.3	-1.2729	0.4944	0.2327	-36	-90
623 B. Virginis	6.5	1.04	7.2	8 49.6	12 1.6	+5 30.7	-1.1264	0.4957	0.2293	-24	-90
95 Virginis	5.4	+1.05	-7.2	-8 53.2	13 19.4	+6 46.3	-1.3582	0.4961	-0.2284	-49	-90
96 Virginis	6.5	1.07	7.6	9 54.6	14 33.7	+7 58.6	-0.5084	0.4965	0.2276	+13	-74
$\kappa$ Virginis	4.2	1.09	7.5	9 51.4	16 41.1	+10 2.4	-1.0489	0.4971	0.2260	-18	-90
2 Libræ	6.3	1.15	8.1	11 18.3	22 23.6	-8 24.6	-0.7247	0.4990	0.2214	+1	-90
4 G. Libræ	6.5	1.16	8.1	11 15.8	23 4.6	-7 44.8	-0.9223	0.4993	0.2209	-11	-90
$\mu$ Libræ	5.4	+1.31	-8.8	-13 46.6	15 12 13.8	+5 2.1	-0.9684	0.5049	-0.2085	-16	-90

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	$\gamma$	$\alpha'$	$\gamma'$	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
8 Libræ	5.4	+1.32	-9.4	-15 37.6	15 12 56.0	+5 43.1	+0.9313	0.5052	-0.2078	+74	+9
$\alpha^a$ Libræ	2.9	1.32	9.5	15 40.3	13 2.0	+5 48.9	+0.9599	0.5053	0.2077	+74	+11
$\nu$ Libræ	5.3	1.41	9.3	15 54.7	21 16.8	-10 10.6	-0.4502	0.5095	0.1985	+12	-70
22 Libræ	6.5	1.42	9.4	16 8.3	21 22.7	-10 4.9	-0.2174	0.5096	0.1984	+24	-55
26 Libræ	6.3	1.47	9.7	17 26.1	16 1 21.9	-6 12.8	+0.4344	0.5118	0.1936	+59	-19
28 Libræ	6.2	+1.51	-9.8	-17 50.1	4 36.7	-3 3.7	+0.2540	0.5136	-0.1895	+48	-28
11 H. Libræ	5.4	1.59	10.0	19 22.0	10 32.8	+2 41.6	+0.8451	0.5172	0.1815	+71	+5
41 Libræ	5.3	1.63	9.8	19 0.5	13 42.9	+5 46.0	-0.1192	0.5191	0.1771	+26	-49
$\kappa$ Libræ	5.0	1.64	9.8	19 23.4	15 14.1	+7 14.4	+0.0345	0.5200	0.1748	+34	-40
$\lambda$ Libræ	4.9	1.71	9.6	19 54.1	20 52.7	-11 17.4	-0.3640	0.5237	0.1663	+13	-64
10 G. Scorpii	5.9	+1.74	-9.8	-20 43.5	23 0.0	-9 14.0	+0.1948	0.5250	-0.1629	+41	-32
$\omega^1$ Scorpii	4.3	1.79	9.4	20 25.7	17 3 27.6	-4 54.8	-0.8422	0.5280	0.1557	-15	-90
$\omega^2$ Scorpii	4.6	1.80	9.5	20 37.7	3 44.6	-4 38.4	-0.6660	0.5282	0.1552	-5	-90
84 B. Scorpii	6.3	1.84	9.3	20 52.9	7 9.6	-1 19.8	-0.9073	0.5305	0.1494	-20	-90
51 G. Scorpii	6.5	1.86	9.3	21 5.0	8 21.4	0 10.3	-0.8632	0.5313	0.1473	-17	-90
$\rho$ Ophiuchi	4.7	+1.92	-9.6	-23 14.6	12 25.5	+3 45.9	+0.9262	0.5339	-0.1400	+67	+11
126 B. Scorpii	6.1	2.02	9.2	24 17.8	19 56.9	+11 2.6	+1.0806	0.5389	0.1258	+66	+24
24 Ophiuchi	5.5	2.08	8.3	23 0.6	18 3 0.1	-6 8.3	-1.1658	0.5436	0.1116	-44	-90
88 B. Ophiuchi	6.3	2.13	8.6	24 57.5	4 24.9	-4 46.4	+0.8100	0.5445	0.1087	+65	+4
26 Ophiuchi	5.8	2.13	8.6	24 51.3	4 30.2	-4 41.3	+0.6868	0.5445	0.1085	+64	-4
137 B. Ophiuchi	6.3	+2.20	-8.0	-25 8.8	9 59.6	+0 37.0	+0.4415	0.5479	-0.0968	+48	-18
39 Ophiuchi	5.1	2.20	7.5	24 11.5	12 37.1	+3 9.1	-0.8474	0.5495	0.0910	-23	-90
$\theta$ Ophiuchi	3.3	2.24	7.5	24 54.8	14 23.9	+4 52.3	-0.2190	0.5505	0.0870	+11	-56
191 B. Ophiuchi	6.3	2.24	7.2	24 9.8	15 47.7	+6 13.2	-1.1541	0.5514	0.0838	-45	-90
$\delta$ Ophiuchi (var.)	4.4	2.24	7.2	24 5.7	16 21.7	+6 46.0	-1.2758	0.5517	0.0826	-61	-90
136 G. Ophiuchi	6.3	+2.27	-7.4	-25 52.0	16 34.6	+6 58.4	+0.6363	0.5518	-0.0821	+59	-6
151 G. Ophiuchi	6.0	2.30	7.3	26 12.2	18 42.9	+9 2.3	+0.8324	0.5530	0.0772	+64	+6
4 G. Sagittarii	6.2	2.38	6.5	26 56.7	19 2 4.8	-7 51.4	+1.1317	0.5570	0.0599	+63	+31
66 B. Sagittarii	4.7	2.50	4.7	27 4.6	14 55.2	+4 31.6	+0.7032	0.5626	0.0281	+61	-2
67 B. Sagittarii	6.4	2.47	4.5	25 38.4	15 13.4	+4 49.1	-0.8576	0.5627	0.0273	-29	-90
68 G. Sagittarii	6.2	+2.52	-4.1	-26 41.4	19 4.9	+8 32.2	+0.1895	0.5641	-0.0175	+26	-32
$\lambda$ Sagittarii	2.9	2.49	4.0	25 28.4	19 12.5	+8 39.6	-1.1251	0.5641	0.0172	-49	-90
69 G. Sagittarii	6.3	2.52	4.0	26 48.8	19 14.4	+8 41.5	+0.3195	0.5641	0.0171	+33	-24
86 B. Sagittarii	6.5	2.52	4.0	26 38.4	19 36.3	+9 2.5	+0.1277	0.5642	-0.0161	+23	-35
$\phi$ Sagittarii	3.3	2.58	2.9	27 5.1	20 2 43.0	-8 6.3	+0.5557	0.5663	+0.0023	+48	-11
$\sigma$ Sagittarii	2.3	+2.58	-2.2	-26 24.6	6 48.6	-4 9.6	-0.1388	0.5672	+0.0130	+8	-51
201 B. Sagittarii	5.9	2.61	1.0	26 3.5	14 25.1	+3 10.2	-0.3398	0.5683	0.0330	-1	-64
$\psi$ Sagittarii	4.8	2.60	-0.8	25 24.8	15 24.3	+4 7.1	-0.9972	0.5684	0.0356	-37	-90
248 B. Sagittarii	5.7	2.66	+0.1	27 10.2	21 25.5	+9 55.1	+1.1429	0.5687	0.0514	+63	+32
51 Sagittarii	5.8	2.61	0.7	24 55.0	21 0 3.8	-11 32.5	-1.1169	0.5687	0.0583	-45	-90
$\lambda$ Sagittarii	4.7	+2.62	+0.7	-25 5.0	0 20.7	-11 16.2	-0.9230	0.5687	+0.0590	-31	-90
$\omega$ Sagittarii	4.8	2.67	2.1	26 32.3	8 24.1	-3 30.6	+1.1859	0.5681	0.0799	+63	+37
$\Lambda$ Sagittarii	4.9	2.66	2.2	26 26.3	9 43.7	-2 13.9	+1.1882	0.5679	0.0833	+64	+37
56 B. Capricorni	6.3	2.61	5.4	24 6.1	22 3 19.0	-9 17.1	+0.5588	0.5641	0.1265	+57	-11
$\chi$ Capricorni	5.3	2.50	6.9	21 33.2	15 38.4	+2 35.9	-0.3889	0.5598	0.1544	+9	-67
27 Capricorni	6.1	+2.49	+6.8	-20 55.0	16 4.5	+3 1.0	-0.9905	0.5597	+0.1553	-26	-90
$\phi$ Capricorni	5.3	2.48	7.3	21 1.4	18 44.1	+5 34.9	-0.4565	0.5586	0.1609	+6	-72
33 Capricorni	5.3	2.46	7.8	21 14.0	22 28.6	+9 11.5	+0.3792	0.5571	0.1687	+51	-22
35 Capricorni	6.0	2.46	8.1	21 35.1	23 50.0	+10 30.0	+0.9778	0.5565	0.1715	+68	+14
128 B. Capricorni	6.5	2.42	8.0	19 32.3	23 1 3.9	+11 41.3	-0.9496	0.5561	0.1739	-21	-90
37 Capricorni	5.7	+2.42	+8.5	-20 29.0	3 12.4	-10 14.7	+0.4157	0.5551	+0.1781	+54	-20
$\epsilon$ Capricorni	4.7	2.41	8.5	19 52.0	4 12.0	-9 17.2	-0.0505	0.5547	0.1800	+29	-45
$\kappa$ Capricorni	4.8	2.39	8.8	19 16.5	6 40.7	-6 53.7	-0.2171	0.5536	0.1847	+21	-55
143 B. Capricorni	6.1	2.40	8.9	20 1.8	6 55.6	-6 39.3	+0.6172	0.5535	0.1852	+67	-9
154 B. Capricorni	6.1	2.36	9.3	19 2.4	10 43.1	-2 59.6	+0.3001	0.5519	0.1922	+49	-26
161 B. Capricorni	6.4	+2.31	+9.8	-18 20.0	15 26.9	+1 34.3	+0.4922	0.5498	+0.2004	+61	-16



## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S				AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
29 Aquarii ( <i>mean</i> )	6.5	+2.29	+ 9.7	-17 23.8	23 15 34.3	+ 1 41.5	-0.4585	0.5497	+0.2007	+10	-71
56 Aquarii	6.1	2.17	10.8	15 2.6	24 4 16.8	-10 1.8	-0.2196	0.5443	0.2205	+25	-55
69 Aquarii	5.6	2.09	11.5	14 31.7	12 20.6	- 2 14.2	+1.0687	0.5411	0.2313	+75	+18
r Aquarii	4.4	2.08	11.5	14 3.9	13 13.3	- 1 23.2	+0.7936	0.5408	0.2323	+76	0
74 Aquarii	5.8	2.04	11.3	12 5.5	15 2.5	+ 0 22.4	-0.8183	0.5401	0.2345	- 5	-90
257 B. Aquarii	6.3	+2.03	+11.9	-13 33.0	17 53.7	+ 3 7.9	+1.3597	0.5391	+0.2378	+76	+49
290 B. Aquarii	6.3	1.94	12.0	11 10.5	25 0 59.7	+10 0.0	+0.6258	0.5367	0.2453	+76	-10
$\psi^A$ Aquarii	4.5	1.94	11.7	9 34.5	1 33.6	+10 32.8	-0.8821	0.5366	0.2458	- 7	-90
$\psi^B$ Aquarii	4.6	1.92	11.8	9 40.2	2 31.6	+11 28.8	-0.5452	0.5363	0.2467	+12	-76
$\psi^C$ Aquarii	5.2	1.92	11.9	10 6.0	3 1.5	+11 57.8	+0.0191	0.5361	0.2472	+41	-41
336 B. Aquarii	6.3	+1.86	+12.2	- 9 45.5	7 47.7	- 7 25.3	+0.8565	0.5348	+0.2513	+80	+ 3
351 B. Aquarii	6.5	1.82	12.0	7 57.6	10 53.9	- 4 25.1	-0.2069	0.5340	0.2538	+30	-54
376 B. Aquarii	6.3	1.75	12.1	6 52.6	17 6.5	+ 1 35.5	+0.2719	0.5328	0.2580	+56	-28
27 Piscium	5.1	1.68	11.6	4 3.1	21 57.8	+ 6 17.4	-1.3621	0.5320	0.2607	-46	-90
4 Ceti	6.3	1.64	11.6	3 2.8	26 2 18.3	+10 29.5	-1.2534	0.5315	0.2626	-32	-90
5 Ceti	6.3	+1.63	+11.6	- 2 56.7	2 31.8	+10 42.6	-1.2980	0.5315	+0.2627	-37	-90
54 B. Ceti	6.3	1.55	11.9	2 42.8	10 21.3	- 5 42.9	+0.5329	0.5311	0.2652	+75	-15
14 Ceti	5.4	1.50	11.7	- 0 59.8	15 39.1	- 0 35.3	+0.1878	0.5311	0.2661	+53	-32
f Piscium	5.1	1.26	11.1	+ 3 8.6	27 11 49.3	- 5 4.0	+1.3290	0.5341	0.2637	+90	+40
$\mu$ Piscium	5.0	1.21	10.4	5 41.0	17 38.5	+ 0 33.9	+0.2772	0.5358	0.2613	+58	-27
o Piscium	4.4	+1.12	+ 9.5	+ 8 42.5	28 0 45.4	+ 7 26.7	-0.9458	0.5382	+0.2573	- 9	-81
SATURN	...	...	...	11 14.9	18 19.7	+ 0 25.7	+0.8789	0.5450	0.2418	+90	+ 8
o Arietis	5.8	0.82	7.7	14 56.0	29 3 38.1	+ 9 25.0	-0.6478	0.5517	0.2309	+ 8	-74
o Arietis	5.5	0.79	7.8	14 42.8	6 42.3	-11 37.2	+0.2763	0.5536	0.2267	+58	-22
124 B. Arietis	6.4	0.78	7.3	16 7.1	7 26.1	-10 55.0	-0.9792	0.5541	0.2257	-12	-74
145 B. Arietis	6.5	+0.73	+ 7.5	+15 30.5	12 27.9	- 6 3.9	+0.7541	0.5573	+0.2182	+90	+ 4
53 Arietis	6.0	0.72	6.9	17 32.1	13 38.1	- 4 56.2	-1.0399	0.5581	0.2164	-17	-72
175 B. Arietis	6.4	0.63	6.6	18 26.6	22 2.5	+ 3 10.1	-0.1975	0.5638	0.2022	+32	-44
26 B. Tauri	6.4	0.60	6.8	17 32.4	30 1 3.1	+ 6 4.1	+1.3160	0.5658	0.1967	+90	+53
13 Tauri	5.6	0.56	6.4	19 24.9	4 27.9	+ 9 21.3	+0.0822	0.5682	0.1901	+47	-28
14 Tauri	6.2	+0.56	+ 6.3	+19 23.0	5 4.6	+ 9 56.6	+0.2297	0.5686	+0.1889	+56	-20
22 H' Tauri	6.1	0.55	6.0	20 38.8	5 20.9	+10 12.4	-0.9963	0.5688	0.1884	-15	-69
A' Tauri	4.6	0.47	5.6	21 50.3	13 41.4	- 5 46.0	-0.7010	0.5745	0.1708	+ 4	-68
39 Tauri	6.1	0.47	5.6	21 46.1	13 57.1	- 5 30.8	-0.5857	0.5746	0.1703	+10	-63
192 B. Tauri	6.1	0.43	5.5	22 11.0	17 1.1	- 2 33.8	-0.4945	0.5767	0.1634	+15	-57
51 Tauri	5.6	+0.42	+ 5.8	+21 21.7	19 16.2	- 0 23.9	+0.6992	0.5782	+0.1582	+90	+ 8
53 Tauri	5.3	0.41	5.9	20 55.6	19 42.2	+ 0 1.1	+1.2070	0.5784	0.1572	+90	+44
56 Tauri	5.2	0.41	5.7	21 33.5	19 45.9	+ 0 4.6	+0.5783	0.5785	0.1570	+82	+ 1
$\kappa$ Tauri	4.1	-0.39	5.5	22 5.4	22 4.4	+ 2 17.8	+0.3970	0.5799	0.1515	+67	- 8
67 Tauri	5.4	0.39	5.6	21 59.8	22 5.7	+ 2 19.0	+0.4950	0.5799	0.1515	+75	- 3
v Tauri	4.2	+0.38	+ 5.4	+22 36.7	22 26.6	+ 2 39.2	-0.0744	0.5802	+0.1506	+38	-32
72 Tauri	5.4	0.38	5.4	22 47.7	22 50.4	+ 3 2.1	-0.2009	0.5804	0.1497	+31	-38
247 B. Tauri	5.8	0.38	5.7	21 25.3	23 8.8	+ 3 19.7	+1.2346	0.5806	0.1469	+90	+48
284 B. Tauri	6.0	0.35	5.2	23 9.5	31 2 30.5	+ 6 33.6	-0.0358	0.5827	0.1406	+40	-29
r Tauri	4.5	0.32	5.4	22 47.2	4 48.5	+ 8 46.3	+0.6578	0.5841	0.1348	+90	+ 8
95 Tauri	6.2	+0.32	+ 5.0	+23 55.2	5 10.8	+ 9 7.7	-0.4391	0.5843	+0.1339	+18	-50
300 B. Tauri	6.2	0.31	5.2	23 27.9	6 10.1	+10 4.6	+0.1526	0.5848	0.1313	+52	-18
315 B. Tauri	6.3	0.27	4.9	24 27.0	10 18.8	- 9 56.5	-0.3225	0.5872	0.1204	+24	-42
99 Tauri	6.0	0.27	5.1	23 48.6	10 55.9	- 9 20.9	+0.3994	0.5875	0.1188	+68	- 4
k Tauri	5.6	0.26	4.7	24 54.8	11 3.0	- 9 14.1	-0.7032	0.5875	0.1185	+ 3	-65
103 Tauri	5.5	+0.23	+ 5.0	+24 8.9	14 57.3	- 5 29.0	+0.5132	0.5895	+0.1078	+77	+ 3
118 Tauri	5.4	0.16	4.8	25 4.8	23 8.6	+ 2 22.5	+0.3591	0.5929	0.0847	+65	- 3

AUGUST.

112 B. Aurigæ	5.7	+0.14	+ 4.3	+26 52.2	1 2 8.6	+ 5 15.2	-1.2147	0.5940	+0.0759	-41	-63
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ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.												
AUGUST.												
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting		
Name.	Mag.	Red'n's from 1910.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y'</i>	<i>x'</i>	<i>y'</i>	N.	S.	
		$\Delta\alpha$	$\Delta\delta$		d h m	h m						
125 Tauri	5.1	+0.13	+4.6	+25 50.9	1 3 9.3	+ 6 13.3	-0.1040	0.5943	+0.0730	+36	-26	
139 Tauri	4.7	+0.08	4.6	25 56.7	10 8.7	-11 4.3	+0.2360	0.5961	+0.0521	+57	-7	
37 Geminorum	5.7	-0.05	4.8	25 29.4	2 8 1.3	+ 9 54.4	+1.1128	0.5962	-0.0147	+90	+48	
39 Geminorum	6.2	0.06	4.7	26 12.1	9 20.9	+11 10.8	+0.3656	0.5960	0.0188	+66	+3	
40 Geminorum	6.3	-0.06	4.6	26 2.3	9 36.2	+11 25.5	+0.5269	0.5959	0.0195	+79	+12	
NEW MOON.												
$\omega$ Virginis	5.4	+0.15	+1.2	+ 8 38.0	7 12 43.3	+10 13.0	-0.9672	0.5098	-0.2442	-10	-81	
$\nu$ Virginis	4.2	0.16	+0.6	7 2.0	16 36.5	-10 0.6	-0.2013	0.5078	0.2459	+32	-52	
$\delta$ Virginis	5.2	-0.20	-0.2	4 9.4	8 0 5.0	- 2 45.0	+1.0557	0.5042	0.2482	+90	+16	
$\epsilon$ Virginis	5.1	+0.27	-0.7	+ 3 48.8	11 4.7	+ 7 56.0	-1.3141	0.4999	-0.2499	-38	-86	
$\gamma$ Virginis ( <i>mean</i> )	2.9	0.32	2.3	- 0 57.4	22 42.6	- 4 45.5	+0.9650	0.4967	0.2497	+89	+10	
$\zeta$ Virginis	5.7	0.41	3.3	3 19.7	9 8 34.5	+ 4 50.1	+1.1019	0.4950	0.2478	+87	+19	
46 Virginis	6.1	0.42	3.2	2 53.1	9 5.7	+ 5 20.4	+0.4898	0.4950	0.2477	+72	-17	
48 Virginis	6.5	0.43	3.4	3 10.8	10 55.2	+ 7 6.9	+0.3604	0.4948	0.2473	+63	-24	
65 Virginis	6.0	+0.52	-4.0	- 4 27.3	21 38.2	- 6 27.7	-0.8728	0.4943	-0.2433	- 5	-90	
66 Virginis	5.7	0.53	4.1	4 41.7	22 18.6	- 5 48.4	-0.7730	0.4943	0.2431	+ 1	-90	
72 Virginis	6.1	0.56	4.6	6 0.4	10 1 33.1	- 2 39.1	-0.1175	0.4944	0.2415	+35	-49	
$\iota$ Virginis	4.8	0.56	4.6	5 47.6	2 24.6	- 1 49.1	-0.5606	0.4944	0.2411	+13	-77	
$m$ Virginis	5.4	0.60	5.4	8 15.0	7 42.5	+ 3 20.1	+0.8728	0.4949	0.2382	+82	+ 4	
575 B. Virginis	6.2	+0.63	-5.9	- 9 15.6	10 47.0	+ 6 19.5	+1.2554	0.4952	-0.2365	+81	+33	
96 Virginis	6.5	0.75	6.2	9 54.6	22 42.0	- 6 5.3	-0.7982	0.4975	0.2281	- 2	-90	
$\kappa$ Virginis	4.2	0.77	6.2	9 51.4	11 0 48.8	- 4 2.1	-1.3378	0.4979	0.2266	-46	-90	
$\lambda$ Virginis	4.7	0.80	7.4	12 57.6	4 9.0	- 0 47.5	+1.3368	0.4989	0.2238	+77	+44	
2 Libræ	6.3	0.83	6.8	11 18.3	6 30.0	+ 1 29.6	-1.0139	0.4997	0.2217	-17	-90	
4 G. Libræ	6.5	+0.83	-6.8	-11 15.8	7 10.8	+ 2 9.2	-1.2110	0.4998	-0.2211	-32	-90	
$\mu$ Libræ	5.4	0.98	7.7	13 46.6	20 18.3	- 9 5.7	-1.2535	0.5047	0.2082	-39	-90	
8 Libræ	5.4	0.99	8.3	15 37.5	21 0.3	- 8 24.8	+0.6456	0.5051	0.2074	+73	- 8	
$\alpha^*$ Libræ	2.9	0.99	8.4	15 40.2	21 6.3	- 8 19.0	+0.6743	0.5051	0.2073	+74	- 7	
$\nu$ Libræ	5.3	1.09	8.4	15 54.6	12 5 20.9	- 0 18.7	-0.7306	0.5088	0.1978	- 3	-90	
22 Libræ	6.5	+1.09	-8.5	-16 8.3	5 26.8	- 0 13.0	-0.4977	0.5089	-0.1977	+10	-74	
26 Libræ	6.3	1.14	8.9	17 26.1	9 26.2	+ 3 39.4	+0.1569	0.5108	0.1928	+43	-34	
28 Libræ	6.2	1.18	9.0	17 50.1	12 41.1	+ 6 48.5	-0.0209	0.5125	0.1886	+33	-44	
150 B. Libræ	6.1	1.26	9.6	19 51.6	18 10.4	-11 52.1	+1.2028	0.5154	0.1810	+70	+32	
11 H. Libræ	5.4	1.27	9.4	19 22.0	18 37.8	-11 25.5	+0.5755	0.5156	0.1804	+65	-11	
41 Libræ	5.3	+1.31	-9.2	-19 0.5	21 48.4	- 8 20.6	-0.3864	0.5175	-0.1758	+13	-66	
$\kappa$ Libræ	5.0	1.32	9.3	19 23.4	23 19.8	- 6 52.1	-0.2311	0.5182	0.1736	+21	-56	
$\lambda$ Libræ	4.9	1.40	9.3	19 54.1	13 4 59.4	- 1 22.9	-0.6243	0.5218	0.1649	- 1	-86	
10 G. Scorpïi	5.9	1.44	9.5	20 43.5	7 7.1	+ 0 40.9	-0.0625	0.5230	0.1614	+27	-46	
$\omega^*$ Scorpïi	4.3	1.50	9.2	20 25.7	11 35.7	+ 5 1.0	-1.0956	0.5257	0.1541	-33	-90	
$\omega^*$ Scorpïi	4.6	+1.50	-9.2	-20 37.7	11 52.9	+ 5 17.7	-0.9188	0.5259	-0.1536	-20	-90	
84 B. Scorpïi	6.3	1.55	9.2	20 52.9	15 18.7	+ 8 37.0	-1.1564	0.5280	0.1478	-38	-90	
51 G. Scorpïi	6.5	1.57	9.2	21 5.0	16 30.8	+ 9 46.8	-1.1108	0.5287	0.1456	-35	-90	
$\rho$ Ophiuchi	4.7	1.64	9.6	23 14.6	20 36.0	-10 15.8	+0.6863	0.5314	0.1384	+66	- 4	
126 B. Scorpïi	6.1	1.76	9.5	24 17.8	14 4 9.7	- 2 56.8	+0.8512	0.5362	0.1240	+66	+ 6	
88 B. Ophiuchi	6.3	+1.89	-9.1	-24 57.5	12 40.3	+ 5 16.9	+0.5926	0.5415	-0.1068	+58	- 9	
26 Ophiuchi	5.8	1.89	9.0	24 51.3	12 45.7	+ 5 22.1	+0.4693	0.5415	0.1067	+51	-16	
137 B. Ophiuchi	6.3	1.97	8.7	25 8.8	18 16.8	+10 42.1	+0.2322	0.5449	0.0949	+36	-29	
39 Ophiuchi	5.1	1.99	8.1	24 11.5	20 55.2	-10 45.0	-1.0543	0.5465	0.0891	-37	-90	
$\theta$ Ophiuchi	3.3	2.03	8.1	24 54.8	22 42.5	- 9 1.3	-0.4223	0.5476	0.0851	0	-70	
136 G. Ophiuchi	6.3	+2.07	-8.2	-25 52.0	15 0 53.9	- 6 54.5	+0.4377	0.5488	-0.0802	+46	-18	
151 G. Ophiuchi	6.0	2.11	8.1	26 12.2	3 2.9	- 4 49.9	+0.6375	0.5500	0.0753	+59	- 6	
4 G. Sagittarii	6.2	2.22	7.5	26 56.7	10 27.0	+ 2 18.7	+0.9495	0.5540	0.0580	+63	+15	
66 B. Sagittarii	4.7	2.39	5.9	27 4.6	23 20.8	- 9 15.0	+0.5433	0.5601	0.0263	+49	-12	
67 B. Sagittarii	6.4	2.37	5.5	25 38.4	23 39.0	- 8 57.4	-1.0176	0.5602	0.0255	-40	-90	
68 G. Sagittarii	6.2	+2.44	-5.2	-26 41.4	16 3 31.2	- 5 13.6	+0.0370	0.5616	-0.0157	+18	-40	

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.	Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$							
		s	"	°	d h m	h m			°	°
69 G. Sagittarii	6.3	+2.44	- 5.2	-26 48.8	16 3 40.8	- 5 4.3	+0.1673	0.5617	-0.0152	+25 -33
86 B. Sagittarii	6.5	2.44	5.1	26 38.5	4 2.8	- 4 43.1	-0.0238	0.5618	-0.0143	+14 -44
$\phi$ Sagittarii	3.3	2.53	4.2	27 5.1	11 10.6	+ 2 9.1	+0.4175	0.5642	+0.0042	+39 -19
$\sigma$ Sagittarii	2.3	2.56	3.4	26 24.6	15 16.7	+ 6 6.3	-0.2686	0.5653	0.0149	+ 1 -59
201 B. Sagittarii	5.9	2.63	2.1	26 3.5	22 53.5	-10 33.6	-0.4540	0.5669	0.0349	- 6 -73
$\psi$ Sagittarii	4.8	+2.63	- 1.8	-25 24.8	23 52.7	- 9 36.7	-1.1084	0.5670	+0.0375	-46 -90
248 B. Sagittarii	5.7	2.72	1.2	27 10.2	17 5 53.8	- 3 48.7	+1.0405	0.5677	0.0534	+63 +22
51 Sagittarii	5.8	2.69	0.3	24 55.0	8 31.8	- 1 16.6	-1.2090	0.5679	0.0604	-54 -90
$h$ Sagittarii	4.7	2.70	- 0.3	25 5.0	8 48.7	- 1 0.4	-1.0148	0.5679	0.0611	-37 -90
$\omega$ Sagittarii	4.8	2.80	+ 0.9	26 32.3	16 50.8	+ 6 44.0	+1.1057	0.5680	-0.0821	+63 +28
$A$ Sagittarii	4.9	+2.79	+ 1.1	-26 26.4	18 10.2	+ 8 0.5	+1.1107	0.5679	+0.0855	+64 +28
56 B. Capricorni	6.3	2.85	4.8	24 6.1	18 11 39.4	+ 0 51.1	+0.5219	0.5656	0.1292	+55 -13
86 B. Capricorni	6.2	2.84	5.4	24 7.2	17 9.2	+ 6 8.9	+1.2836	0.5642	0.1422	+66 +49
$\chi$ Capricorni	5.3	2.80	6.8	21 33.2	23 52.0	-11 22.9	-0.3915	0.5623	0.1575	+ 9 -67
27 Capricorni	6.1	2.79	6.9	20 55.0	19 0 17.8	-10 58.0	-0.9883	0.5622	0.1585	-25 -90
$\phi$ Capricorni	5.3	+2.79	+ 7.4	-21 1.4	2 55.6	- 8 25.8	-0.4511	0.5613	+0.1643	+ 7 -71
33 Capricorni	5.3	2.80	7.9	21 14.0	6 37.4	- 4 51.9	+0.3880	0.5602	0.1721	+52 -21
35 Capricorni	6.0	2.80	8.2	21 35.1	7 57.8	- 3 34.4	+0.9857	0.5598	0.1749	+68 +15
128 B. Capricorni	6.5	2.76	8.5	19 32.3	9 10.7	- 2 24.1	-0.9251	0.5594	0.1774	-19 -90
37 Capricorni	5.7	2.78	8.8	20 29.0	11 17.6	- 0 21.6	+0.4357	0.5586	0.1818	+56 -19
$\epsilon$ Capricorni	4.7	+2.77	+ 9.0	-19 52.0	12 16.4	+ 0 35.0	-0.0246	0.5583	+0.1837	+31 -44
$\kappa$ Capricorni	4.8	2.76	9.4	19 16.5	14 43.1	+ 2 56.5	-0.1840	0.5574	0.1885	+23 -53
143 B. Capricorni	6.1	2.78	9.4	20 1.8	14 57.8	+ 3 10.8	+0.6446	0.5573	0.1890	+68 - 7
154 B. Capricorni	6.1	2.76	9.9	19 2.4	18 41.9	+ 6 47.0	+0.3391	0.5559	0.1961	+51 -24
161 B. Capricorni	6.4	2.73	10.6	18 20.0	23 21.3	+11 16.5	+0.5413	0.5542	0.2045	+64 -14
29 Aquarii ( <i>mean</i> )	6.5	+2.71	+10.7	-17 23.7	23 28.6	+11 23.6	-0.4011	0.5541	+0.2047	+14 -67
56 Aquarii	6.1	2.64	12.3	15 2.6	20 11 58.0	- 0 32.9	-0.1325	0.5494	0.2251	+30 -50
69 Aquarii	5.6	2.60	13.3	14 31.6	19 52.7	+ 7 5.6	+1.1631	0.5467	0.2360	+75 +25
$\gamma$ Aquarii	4.4	2.59	13.4	14 3.8	20 44.4	+ 7 55.5	+0.8928	0.5464	0.2371	+76 + 6
74 Aquarii	5.8	2.56	13.5	12 5.5	22 31.4	+ 9 38.9	-0.6988	0.5458	0.2394	+ 2 -90
290 B. Aquarii	6.3	+2.51	+14.5	-11 10.4	21 8 16.5	- 4 55.5	+0.7545	0.5428	+0.2503	+76 - 3
$\eta$ Aquarii	4.5	2.50	14.3	9 34.4	8 49.6	- 4 23.5	-0.7366	0.5427	0.2509	+ 2 -90
$\mu$ Aquarii	4.6	2.49	14.4	9 40.2	9 46.4	- 3 28.7	-0.4010	0.5424	0.2519	+19 -66
$\nu$ Aquarii	5.2	2.49	14.6	10 5.9	10 15.7	- 3 0.3	+0.1588	0.5423	0.2523	+49 -34
336 B. Aquarii	6.3	2.45	15.0	9 45.4	14 55.8	+ 1 30.5	+0.9982	0.5411	0.2565	+80 +12
351 B. Aquarii	6.5	+2.41	+15.0	- 7 57.5	17 58.1	+ 4 26.8	-0.0471	0.5404	+0.2589	+38 -45
376 B. Aquarii	6.3	2.36	15.4	6 52.6	20 0 2.6	+10 19.1	+0.4404	0.5392	0.2632	+67 -20
27 Piscium	5.1	2.31	15.2	4 3.1	4 47.5	- 9 5.3	-1.1666	0.5384	0.2659	-24 -90
29 Piscium	5.1	2.30	15.3	3 31.5	6 16.0	- 7 39.7	-1.3073	0.5382	0.2666	-38 -90
4 Ceti	6.3	2.28	15.4	3 2.7	9 2.4	- 4 58.8	-1.0504	0.5379	0.2678	-15 -90
5 Ceti	6.3	+2.28	+15.4	- 2 56.6	9 15.6	- 4 46.0	-1.0941	0.5378	+0.2679	-18 -90
54 B. Ceti	6.3	2.22	15.8	2 42.8	16 55.1	+ 2 38.5	+0.7331	0.5373	0.2702	+87 - 4
10 Ceti	6.4	2.21	15.4	0 32.6	17 54.7	+ 3 36.1	-1.1907	0.5372	0.2704	-26 -90
14 Ceti	5.4	2.18	15.7	- 0 59.7	22 6.2	+ 7 39.3	+0.4009	0.5372	0.2709	+66 -22
77 Piscium	6.4	2.05	15.0	+ 4 26.0	23 12 17.0	- 2 37.8	-1.2395	0.5384	0.2696	-30 -86
$\mu$ Piscium	5.0	+1.97	+14.9	+ 5 41.1	23 36.0	+ 8 18.8	+0.5261	0.5406	+0.2649	+75 -15
$\nu$ Piscium	4.4	1.90	14.2	8 42.5	24 6 36.1	- 8 55.1	-0.6821	0.5425	0.2604	+ 7 -81
SATURN				11 15.2	25 0 37.4	+ 8 29.4	+1.3028	0.5500	0.2434	+90 +42
29 Arietis	6.1	1.71	12.3	14 38.4	4 1.9	+11 46.9	-1.2903	0.5510	0.2389	-38 -75
$\alpha$ Arietis	5.8	1.67	12.1	14 56.1	9 10.7	- 7 15.1	-0.3760	0.5535	0.2319	+23 -58
$\sigma$ Arietis	5.5	+1.64	+12.1	+14 42.9	12 13.6	- 4 18.6	+0.5458	0.5550	+0.2275	+77 - 9
124 B. Arietis	6.4	1.64	11.6	16 7.2	12 57.2	- 3 36.6	-0.7069	0.5555	0.2265	+ 5 -74
145 B. Arietis	6.5	1.58	11.6	15 30.6	17 57.4	+ 1 13.0	+1.0226	0.5582	0.2186	+90 +20
53 Arietis	6.0	1.58	11.0	17 32.2	19 7.4	+ 2 20.4	-0.7692	0.5588	0.2167	+ 1 -73
175 B. Arietis	6.4	1.50	10.4	18 26.7	26 3 30.6	+10 25.6	+0.0695	0.5634	0.2019	+46 -30
14 H. Tauri	6.5	+1.46	+ 9.5	+20 37.5	8 31.7	- 8 44.4	-1.1468	0.5662	+0.1923	-27 -69

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.															
AUGUST.															
THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.			
Name.		Mag.	Red'ns from 1910.0.		Apparent Declination.	Washington Mean Time.			Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N. S.		
			$\Delta\alpha$	$\Delta\delta$											
			<i>s</i>	<i>"</i>	<i>°</i>	<i>d</i>	<i>h</i>	<i>m</i>	<i>h</i>	<i>m</i>				<i>°</i>	<i>'</i>
13	Tauri	5.6	+1.44	+9.9	+19 24.9	26	9	56.2	- 7	23.0	+0.3460	0.5670	+0.1894	+63	-14
14	Tauri	6.2	1.44	9.9	19 23.0		10	32.8	- 6	47.8	+0.4934	0.5674	0.1882	+74	- 7
22	H' Tauri	6.1	1.44	9.4	20 38.9		10	49.2	- 6	32.0	-0.7342	0.5675	0.1876	+ 2	-69
A'	Tauri	4.6	1.36	8.6	21 50.3		19	11.3	+ 1	31.4	-0.4450	0.5723	0.1697	+18	-54
39	Tauri	6.1	1.36	8.6	21 46.1		19	27.0	+ 1	46.5	-0.3298	0.5725	0.1690	+24	-48
192	B. Tauri	6.1	+1.32	+8.4	+22 11.1		22	32.0	+ 4	44.5	-0.2411	0.5741	+0.1621	+29	-42
51	Tauri	5.6	1.30	8.6	21 21.7	27	0	47.9	+ 6	55.1	+0.9545	0.5753	0.1568	+90	+24
56	Tauri	5.2	1.29	8.5	21 33.5		1	17.8	+ 7	23.9	+0.8330	0.5756	0.1556	+90	+16
$\kappa$	Tauri	4.1	1.28	8.2	22 5.5		3	37.3	+ 9	38.1	+0.6490	0.5769	0.1500	+90	+ 6
67	Tauri	5.4	1.28	8.3	21 59.8		3	38.6	+ 9	39.3	+0.7473	0.5769	0.1500	+90	+11
$\nu$	Tauri	4.2	+1.28	+8.0	+22 36.7		3	59.7	+ 9	59.7	+0.1755	0.5771	+0.1491	+53	-19
72	Tauri	5.4	1.27	8.0	22 47.8		4	23.6	+10	22.6	+0.0481	0.5772	0.1481	+45	-25
284	B. Tauri	6.0	1.24	7.6	23 9.6		8	5.5	-10	4.1	+0.2103	0.5791	0.1390	+55	-16
$\tau$	Tauri	4.5	1.20	7.7	22 47.2		10	24.8	- 7	50.2	+0.9046	0.5802	0.1330	+90	+23
95	Tauri	6.2	1.21	7.3	23 55.3		10	47.3	- 7	28.5	-0.1978	0.5803	0.1321	+31	-37
300	B. Tauri	6.2	+1.19	+7.4	+23 27.9		11	47.2	- 6	31.0	+0.3957	0.5809	+0.1295	+68	- 6
315	B. Tauri	6.3	1.15	6.8	24 27.1		15	58.6	- 2	29.4	-0.0865	0.5827	0.1185	+38	-29
99	Tauri	6.0	1.14	7.0	23 48.6		16	36.0	- 1	53.5	+0.6386	0.5830	0.1169	+90	+ 9
$\epsilon$	Tauri	5.6	1.15	6.6	24 54.8		16	43.2	- 1	46.6	-0.4702	0.5830	0.1165	+16	-51
103	Tauri	5.5	1.10	6.7	24 8.9		20	40.3	+ 2	1.3	+0.7484	0.5846	0.1059	+90	+16
118	Tauri	5.4	+1.02	+6.0	+25 4.8	28	4	58.3	+ 9	59.5	+0.5833	0.5873	+0.0826	+84	+ 9
112	B. Aurigæ	5.7	1.00	5.2	26 52.2		8	1.1	-11	4.9	-1.0059	0.5882	0.0739	-19	-63
125	Tauri	5.1	0.98	5.5	25 50.9		9	2.7	-10	5.8	+0.1114	0.5884	0.0709	+49	-15
139	Tauri	4.7	0.90	5.2	25 56.7		16	9.0	- 3	16.5	+0.4440	0.5897	0.0501	+72	+ 5
415	B. Tauri	6.1	0.90	4.6	27 34.2		17	17.7	- 2	10.7	-1.1635	0.5899	+0.0467	-35	-62
39	Geminorum	6.2	+0.66	+4.0	+26 12.1	29	15	47.8	- 4	34.8	+0.5368	0.5885	-0.0204	+80	+12
40	Geminorum	6.3	0.66	4.0	26 2.3		16	3.4	- 4	19.8	+0.6993	0.5884	0.0211	+90	+21
47	Geminorum	5.6	0.63	3.5	27 0.4		20	42.9	+ 0	8.6	-0.4283	0.5872	0.0348	+18	-41
134	B. Geminorum	6.5	0.61	3.4	26 51.2		22	56.9	+ 2	17.3	-0.3559	0.5864	0.0413	+22	-37
A	Geminorum	5.1	0.57	3.8	25 13.5	30	1	30.8	+ 4	45.0	+1.2097	0.5856	0.0487	+90	+55
$\nu$	Geminorum	4.3	+0.54	+3.0	+27 5.8		6	25.4	+ 9	28.1	-0.9984	0.5835	-0.0626	-18	-63
c	Geminorum	5.5	0.51	3.2	26 0.0		9	42.8	-11	22.2	-0.0844	0.5820	0.0718	+38	-25
$\omega$	Cancri	6.0	0.46	3.0	25 38.4		16	29.9	- 4	50.9	-0.2627	0.5785	0.0902	+28	-36
4	Cancri	6.2	0.46	3.1	25 20.3		16	49.8	- 4	31.7	+0.0207	0.5783	0.0911	+44	-21
$\psi$	Cancri	5.9	0.43	2.6	25 46.9		20	22.9	- 1	6.8	-0.7800	0.5762	0.1003	- 2	-64
$\lambda$	Cancri	5.9	+0.40	+3.0	+24 18.4	31	0	32.8	+ 2	53.7	+0.3126	0.5737	-0.1110	+62	- 8
28	Cancri	6.1	0.38	2.8	24 26.7		3	53.7	+ 6	7.0	-0.2163	0.5715	0.1192	+30	-37
$\nu$	Cancri	5.7	0.36	2.8	24 23.2		5	6.4	+ 7	17.0	-0.3011	0.5707	0.1222	+26	-42
$\nu$	Cancri	6.4	0.36	2.8	24 23.5		5	43.8	+ 7	53.0	-0.3845	0.5703	0.1237	+21	-46
$\xi$	Cancri	5.2	0.28	2.6	22 24.6		21	16.3	- 1	8.4	-0.5147	0.5589	0.1583	+14	-58
79	Cancri	6.1	+0.27	+2.6	+22 21.8		21	42.2	- 0	43.4	-0.5333	0.5586	-0.1592	+13	-59
90	H' Cancri	6.1	+0.26	+2.6	+21 39.3		23	8.6	+ 0	39.9	-0.0229	0.5575	-0.1621	+41	-31
NEW MOON.															
SEPTEMBER.															
3	Virginis (mean)	2.9	+0.16	-1.7	- 0 57.4	5	6	57.3	+ 5	17.0	+0.7669	0.4982	-0.2524	+89	- 3
$\epsilon$	Virginis	5.7	0.21	2.5	3 19.6		16	47.3	- 9	9.2	+0.8845	0.4967	0.2505	+87	+ 4
46	Virginis	6.1	0.22	2.4	2 53.1		17	18.4	- 8	39.1	+0.2716	0.4966	0.2504	+58	-29
48	Virginis	6.5	+0.22	-2.6	- 3 10.8		19	7.5	- 6	53.0	+0.1390	0.4955	-0.2499	+50	-36
$\theta$	Virginis	4.6	0.23	3.1	5 3.6		22	26.3	- 3	39.6	+1.3714	0.4963	0.2488	+85	+45
65	Virginis	6.0	0.28	3.2	4 27.3	6	5	47.8	+ 3	29.7	-1.1118	0.4961	0.2459	-20	-90
66	Virginis	5.7	0.29	3.1	4 41.7		6	28.0	+ 4	8.8	-1.0133	0.4961	0.2455	-13	-90
72	Virginis	6.1	0.30	3.6	6 0.4		9	41.6	+ 7	17.1	-0.3627	0.4962	0.2440	+23	-64
$\iota$	Virginis	4.8	+0.30	-3.6	- 5 47.5		10	32.9	+ 8	6.9	-0.8069	0.4963	-0.2435	- 1	-90

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S				AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	y	x'	y'	N. S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				
m Virginis	5.4	+0.32	-4.3	-8 15.0	6 15 49.5	-10 45.2	+0.6184	0.4966	-0.2406	+79 -10
575 B. Virginis	6.2	0.35	4.7	9 15.6	18 53.1	-7 46.7	+0.9969	0.4969	0.2387	+81 +12
96 Virginis	6.5	0.43	5.1	9 54.6	7 6 45.3	+3 45.8	-1.0702	0.4990	0.2300	-20 -90
2 Virginis	4.7	0.46	6.1	12 57.5	12 11.0	+9 2.4	+1.0600	0.5002	0.2254	+77 +16
2 Librae	6.3	0.49	5.7	11 18.3	14 31.6	+11 19.0	-1.2933	0.5009	0.2232	-40 -90
8 Librae	5.4	+0.61	-7.2	-15 37.5	8 4 59.9	+1 22.5	+0.3573	0.5056	-0.2084	+56 -24
a <sup>2</sup> Librae	2.9	0.62	7.2	15 40.2	5 5.9	+1 28.3	+0.3859	0.5056	0.2083	+58 -22
v Librae	5.3	0.70	7.3	15 54.6	13 20.1	+9 28.2	-1.0242	0.5089	0.1985	-21 -90
22 Librae	6.5	0.70	7.4	16 8.3	13 26.0	+9 33.9	-0.7911	0.5089	0.1984	-6 -90
26 Librae	6.3	0.75	7.8	17 26.1	17 25.3	-10 33.8	-0.1366	0.5107	0.1932	+28 -51
28 Librae	6.2	+0.78	-7.9	-17 50.1	20 40.4	-7 24.5	-0.3154	0.5122	-0.1889	+18 -61
150 B. Librae	6.1	0.84	8.5	19 51.6	9 2 10.2	-2 4.5	+0.9105	0.5148	0.1812	+70 +8
11 H. Librae	5.4	0.85	8.4	19 22.0	2 37.6	-1 38.0	+0.2818	0.5151	0.1805	+48 -27
172 B. Librae	5.9	0.89	8.8	20 43.3	5 27.6	+1 7.0	+1.2761	0.5164	0.1763	+69 +42
41 Librae	5.3	0.90	8.2	19 0.5	5 48.6	+1 27.4	-0.6825	0.5166	0.1758	-3 -90
k Librae	5.0	+0.91	-8.4	-19 23.4	7 20.2	+2 56.1	-0.5267	0.5174	-0.1735	+5 -77
2 Librae	4.9	0.98	8.5	19 54.1	13 0.9	+8 26.4	-0.9205	0.5203	0.1646	-19 -90
10 G. Scorpil	5.9	1.01	8.7	20 43.5	15 9.1	+10 30.7	-0.3568	0.5215	0.1611	+13 -65
8 Scorpil	2.6	1.03	9.2	22 22.1	16 26.1	+11 45.3	+1.2564	0.5221	0.1590	+68 +41
62 Scorpil	4.6	1.08	8.6	20 37.7	19 56.2	-8 51.1	-1.2149	0.5241	0.1531	-43 -90
p Ophiuchi	4.7	+1.20	-9.2	-23 14.5	10 4 42.3	-0 21.7	+0.3992	0.5290	-0.1376	+50 -21
126 B. Scorpil	6.1	1.32	9.2	24 17.8	12 19.3	+7 0.5	+0.5690	0.5332	0.1231	+58 -11
88 B. Ophiuchi	6.3	1.45	9.0	24 57.5	20 54.3	-8 41.4	+0.3150	0.5379	0.1057	+41 -25
26 Ophiuchi	5.8	1.45	9.0	24 51.3	20 59.7	-8 36.2	+0.1912	0.5380	0.1055	+35 -32
137 B. Ophiuchi	6.3	1.54	8.8	25 8.8	11 2 34.1	-3 12.9	-0.0429	0.5411	0.0937	+21 -45
36 Ophiuchi (1st star)	5.4	+1.55	-9.9	-26 28.5	3 59.7	-1 50.1	+1.2836	0.5418	-0.0906	+64 +55
8 Ophiuchi	3.3	1.60	8.3	24 54.8	7 2.5	+1 6.5	-0.6971	0.5434	0.0839	-14 -90
136 G. Ophiuchi	6.3	1.65	8.5	25 52.0	9 15.4	+3 14.8	+0.1694	0.5446	0.0790	+30 -33
151 G. Ophiuchi	6.0	1.69	8.5	26 12.2	11 25.8	+5 20.8	+0.3722	0.5456	0.0740	+42 -22
4 G. Sagittarii	6.2	1.81	8.1	26 56.8	18 55.1	-11 25.4	+0.6931	0.5493	0.0567	+61 -3
66 B. Sagittarii	4.7	+2.01	-6.8	-27 4.6	12 7 58.8	+1 10.9	+0.2989	0.5548	-0.0250	+33 -26
67 B. Sagittarii	6.4	1.99	6.3	25 38.4	8 17.2	+1 28.7	-1.2705	0.5549	0.0242	-64 -90
68 G. Sagittarii	6.2	2.07	6.2	26 41.4	12 12.6	+5 15.7	-0.2052	0.5563	0.0144	+5 -55
69 G. Sagittarii	6.3	2.07	6.2	26 48.8	12 22.3	+5 25.1	-0.0740	0.5564	0.0140	+12 -47
86 B. Sagittarii	6.5	2.07	6.1	26 38.5	12 44.6	+5 46.6	-0.2656	0.5565	-0.0131	+2 -59
φ Sagittarii	3.3	+2.19	-5.4	-27 5.1	19 58.3	-11 15.2	+0.1873	0.5587	+0.0053	+25 -32
σ Sagittarii	2.3	2.23	4.6	26 24.6	13 0 7.6	-7 14.9	-0.4971	0.5598	0.0160	-11 -77
τ Sagittarii	3.5	2.33	4.6	27 48.2	5 7.3	-2 26.1	+1.1157	0.5608	0.0289	+62 +29
201 B. Sagittarii	5.9	2.33	3.4	26 3.6	7 50.7	+0 11.5	-0.6725	0.5613	0.0360	-18 -90
248 B. Sagittarii	5.7	2.45	2.8	27 10.3	14 56.5	+7 1.9	+0.8402	0.5623	0.0544	+63 +7
h Sagittarii	4.7	+2.44	-1.7	-25 5.0	17 53.6	+9 52.4	-1.2205	0.5626	+0.0621	-54 -90
ω Sagittarii	4.8	2.58	0.8	26 32.3	14 2 1.7	-6 17.2	+0.9225	0.5629	0.0830	+63 +12
λ Sagittarii	4.9	2.58	-0.6	26 26.4	3 22.0	+4 59.7	+0.9298	0.5628	0.0864	+64 +13
40 B. Capricorni	6.2	2.70	+2.1	25 14.9	17 53.7	+9 0.2	+1.1804	0.5618	0.1227	+65 +34
56 B. Capricorni	6.3	2.73	3.2	24 6.1	21 2.0	-11 58.2	+0.3699	0.5614	0.1303	+46 -22
86 B. Capricorni	6.2	+2.76	+3.8	-24 7.2	15 2 34.4	-6 37.9	+1.1436	0.5605	+0.1433	+66 +29
χ Capricorni	5.3	2.75	5.5	21 33.2	9 19.8	-0 7.1	-0.5204	0.5592	0.1588	+2 -77
27 Capricorni	6.1	2.74	5.7	20 55.0	9 45.8	+0 18.0	-1.1166	0.5591	0.1597	-34 -90
φ Capricorni	5.3	2.75	6.1	21 1.4	12 24.4	+2 50.9	-0.5732	0.5585	0.1656	0 -82
33 Capricorni	5.3	2.78	6.6	21 14.0	16 7.2	+6 25.8	+0.2742	0.5576	0.1735	+45 -28
35 Capricorni	6.0	+2.79	+6.8	-21 35.1	17 27.9	+7 43.7	+0.8746	0.5573	+0.1764	+68 +7
128 B. Capricorni	6.5	2.76	7.4	19 32.3	18 41.1	+8 54.3	-1.0329	0.5570	0.1790	-26 -90
37 Capricorni	5.7	2.79	7.6	20 29.0	20 48.3	+10 57.0	+0.3321	0.5565	0.1833	+50 -25
e Capricorni	4.7	2.78	7.9	19 52.1	21 47.2	+11 53.8	-0.1257	0.5562	0.1853	+25 -50
κ Capricorni	4.8	2.79	8.4	19 16.5	16 0 14.2	-9 44.4	-0.2793	0.5556	0.1902	+18 -59
143 B. Capricorni	6.1	+2.80	+8.2	-20 1.8	0 28.9	-9 30.1	+0.5488	0.5555	+0.1907	+63 -13

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.		
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.		Hour Angle, H	y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d	m						
154 B. Capricorni	6.1	+2.81	+9.0	-19 2.4	16	4 13.3	-5 53.6	+0.2522	0.5545	+0.1980	+47	-29
161 B. Capricorni	6.4	2.81	9.8	18 20.0	8	52.6	-1 24.1	+0.4647	0.5533	0.2066	+60	-18
29 Aquarii ( <i>mean</i> )	6.5	2.79	10.0	17 23.7	8	59.8	-1 17.2	-0.4751	0.5533	0.2068	+10	-72
56 Aquarii	6.1	2.78	12.1	15 2.6	21	26.7	+10 43.8	-0.1762	0.5500	0.2278	+28	-53
69 Aquarii	5.6	2.80	13.2	14 31.6	17	5 18.2	-5 40.9	+1.1327	0.5481	0.2393	+75	+22
$\tau$ Aquarii	4.4	+2.78	+13.3	-14 3.8	6	9.4	-4 51.5	+0.8658	0.5479	+0.2404	+76	+4
74 Aquarii	5.8	2.76	13.8	12 5.5	7	55.6	-3 8.9	-0.7120	0.5475	0.2428	+2	-90
290 B. Aquarii	6.3	2.75	14.9	11 10.4	17	34.3	+6 10.2	+0.7570	0.5456	0.2543	+79	-3
$\psi^1$ Aquarii	4.5	2.75	15.1	9 34.4	18	7.1	+6 41.9	-0.7215	0.5454	0.2549	+2	-90
$\psi^2$ Aquarii	4.6	2.73	15.2	9 40.2	19	3.2	+7 36.0	-0.3859	0.5453	0.2558	+20	-65
$\psi^3$ Aquarii	5.2	+2.74	+15.2	-10 5.9	19	32.0	+8 3.9	+0.1708	0.5452	+0.2563	+49	-34
336 B. Aquarii	6.3	2.73	15.7	9 45.4	18	0 8.3	-11 29.2	+1.0155	0.5445	0.2608	+80	+13
351 B. Aquarii	6.5	2.71	16.1	7 57.5	3	7.8	-8 35.7	-0.0133	0.5441	0.2634	+40	-43
376 B. Aquarii	6.3	2.70	16.6	6 52.5	9	6.3	-2 49.3	+0.4854	0.5436	0.2680	+70	-18
27 Piscium	5.1	2.66	17.0	4 3.0	13	46.0	+1 41.1	-1.0934	0.5434	0.2710	-18	-90
29 Piscium	5.1	+2.66	+17.1	-3 31.4	15	12.8	+3 4.9	-1.2287	0.5432	+0.2717	-29	-90
4 Ceti	6.3	2.65	17.3	3 2.7	17	55.9	+5 42.5	-0.9670	0.5431	0.2730	-10	-90
5 Ceti	6.3	2.65	17.3	2 56.6	18	8.8	+5 55.1	-1.0096	0.5432	0.2731	-12	-90
54 B. Ceti	6.3	2.63	17.8	2 42.7	19	1 38.5	-10 50.2	+0.8166	0.5433	0.2757	+87	0
10 Ceti	6.4	2.62	17.8	0 32.6	2	36.7	-9 54.1	-1.0826	0.5433	0.2759	-17	-90
14 Ceti	5.4	+2.62	+17.9	-0 59.7	6	42.4	-5 56.6	+0.5004	0.5436	+0.2766	+73	-17
77 Piscium	6.4	2.55	17.9	+4 26.1	20	31.9	+7 25.0	-1.0866	0.5457	0.2755	-17	-86
263 B. Piscium	6.4	2.52	17.8	7 30.0	6	43.3	-6 44.5	-1.3462	0.5483	0.2713	-42	-82
$\mu$ Piscium	5.0	2.52	18.0	5 41.1	7	32.3	-5 57.2	+0.6791	0.5485	0.2708	+89	-7
$\nu$ Piscium	4.4	2.49	17.6	8 42.6	14	20.5	+0 37.0	-0.4996	0.5507	0.2662	+17	-70
29 Arietis	6.1	+2.40	+16.0	+14 38.5	21	11 9.0	-3 18.4	-1.0672	0.5593	+0.2439	-17	-75
$\sigma$ Arietis	5.8	2.38	15.6	14 56.1	16	8.9	+1 30.8	-0.1590	0.5617	0.2367	+34	-46
$\sigma$ Arietis	5.5	2.36	15.5	14 43.0	19	6.6	+4 21.9	+0.7542	0.5631	0.2322	+90	+3
124 B. Arietis	6.4	2.36	15.1	16 7.2	19	48.9	+5 2.8	-0.4815	0.5635	0.2310	+17	-63
145 B. Arietis	6.5	2.32	15.0	15 30.7	22	0 40.9	+9 44.0	+1.2309	0.5660	0.2228	+90	+38
53 Arietis	6.0	+2.33	+14.5	+17 32.2	1	48.9	+10 49.5	-0.5373	0.5666	+0.2209	+14	-65
175 B. Arietis	6.4	2.29	13.7	18 26.7	9	58.8	-5 18.9	+0.2976	0.5708	0.2055	+60	-18
14 H <sup>1</sup> . Tauri	6.5	2.27	12.7	20 37.6	14	52.3	-0 36.4	-0.9017	0.5733	0.1955	-8	-69
13 Tauri	5.6	2.25	13.0	19 25.0	16	14.6	+0 42.8	+0.5752	0.5740	0.1925	+82	-3
14 Tauri	6.2	2.25	12.9	19 23.1	16	50.4	+1 17.3	+0.7212	0.5743	0.1912	+90	+5
22 H <sup>1</sup> . Tauri	6.1	+2.26	+12.6	+20 38.9	17	6.3	+1 32.5	-0.4927	0.5745	+0.1907	+16	-59
32 Tauri	5.8	2.23	11.6	22 13.4	22	7.1	+6 21.8	-1.1423	0.5769	0.1794	-27	-68
$\delta^1$ Tauri	4.6	2.20	11.5	21 50.4	23	1 16.8	+9 24.3	-0.2035	0.5785	0.1721	+32	-41
39 Tauri	6.1	2.20	11.4	21 46.2	1	32.1	+9 39.1	-0.0893	0.5786	0.1715	+38	-35
192 B. Tauri	6.1	2.18	11.1	22 11.1	4	33.1	-11 27.1	-0.0006	0.5800	0.1642	+43	-29
51 Tauri	5.6	+2.15	+11.1	+21 21.8	6	46.1	-9 19.2	+1.1844	0.5810	+0.1587	+90	+41
56 Tauri	5.2	2.15	11.0	21 33.6	7	15.4	-8 51.0	+1.0641	0.5812	0.1575	+90	+31
62 Tauri	6.1	2.16	10.0	24 5.7	8	57.9	-7 12.5	-1.2190	0.5819	0.1532	-37	-66
$\kappa$ Tauri	4.1	2.14	10.6	22 5.5	9	32.2	-6 39.5	+0.8826	0.5822	0.1517	+90	+19
67 Tauri	5.4	2.14	10.7	21 59.9	9	33.4	-6 38.4	+0.9800	0.5822	0.1517	+90	+26
$\nu$ Tauri	4.2	+2.14	+10.4	+22 36.8	9	54.0	-6 18.7	+0.4133	0.5823	+0.1508	+69	-8
72 Tauri	5.4	2.13	10.4	22 47.8	10	17.6	-5 55.9	+0.2872	0.5825	0.1498	+60	-13
284 B. Tauri	6.0	2.11	9.8	23 9.6	13	55.2	-2 26.9	+0.4484	0.5840	0.1404	+72	-5
$\tau$ Tauri	4.5	2.08	9.8	22 47.3	16	12.0	-0 15.5	+1.1375	0.5848	0.1343	+90	+40
95 Tauri	6.2	2.09	9.4	23 55.3	16	34.1	+0 5.7	+0.0439	0.5850	0.1333	+46	-24
300 B. Tauri	6.2	+2.07	+9.5	+23 28.0	17	33.0	+1 2.3	+0.6328	0.5853	+0.1307	+89	+7
315 B. Tauri	6.3	2.04	8.7	24 27.1	21	40.2	+4 59.7	+0.1543	0.5867	0.1194	+52	-17
99 Tauri	6.0	2.03	8.8	23 48.7	22	17.1	+5 35.1	+0.8742	0.5869	0.1177	+90	+22
$\delta$ Tauri	5.6	2.05	8.4	24 54.9	22	24.1	+5 41.8	-0.2268	0.5869	0.1174	+30	-36
103 Tauri	5.5	2.00	8.3	24 8.9	24	2 17.7	+9 26.0	+0.9832	0.5880	0.1064	+90	+31
118 Tauri	5.4	+1.92	+7.1	+25 4.8	10	29.4	-6 42.1	+0.8182	0.5897	+0.0827	+90	+22

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, //	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				°	°
112 B. Aurigæ	5.7	+1.91	+6.2	+26 52.2	24 13 30.2	- 3 48.6	-0.7641	0.5902	+0.0739	- 1	-63
125 Tauri	5.1	1.89	6.4	25 50.9	14 31.2	- 2 50.0	+0.3477	0.5903	0.0708	+65	- 2
136 Tauri	4.6	1.85	5.2	27 35.6	19 44.3	+ 2 10.4	-1.0994	0.5907	0.0552	-27	-62
139 Tauri	4.7	1.81	5.6	25 56.7	21 34.0	+ 3 55.7	+0.6764	0.5906	0.0497	+90	+17
415 B. Tauri	6.1	1.82	4.9	27 34.2	22 42.1	+ 5 1.0	-0.9261	0.5906	0.0463	-13	-62
49 Aurigæ	5.1	+1.67	+3.3	+28 5.6	25 11 54.9	- 6 18.2	-1.1198	0.5891	+0.0064	-30	-62
39 Geminorum	6.2	1.52	3.1	26 12.1	21 8.9	+ 2 33.6	+0.7569	0.5865	-0.0212	+90	+24
40 Geminorum	6.3	1.52	3.1	26 2.3	21 24.5	+ 2 48.6	+0.9192	0.5864	0.0220	+90	+34
47 Geminorum	5.6	1.48	2.2	27 0.3	26 2 4.7	+ 7 17.7	-0.2126	0.5847	0.0357	+30	-29
134 B. Geminorum	6.5	1.45	2.0	26 51.2	4 19.2	+ 9 26.9	-0.1420	0.5837	0.0421	+35	-25
59 Geminorum	5.7	+1.42	+1.5	+27 48.8	7 16.9	-11 42.4	-1.2729	0.5824	-0.0506	-57	-62
v Geminorum	4.3	1.36	1.2	27 5.8	11 50.0	- 7 19.9	-0.7930	0.5801	0.0635	- 3	-63
c Geminorum	5.5	1.31	1.3	26 0.0	15 8.8	- 4 8.8	+0.1198	0.5782	0.0726	+50	-14
φ Geminorum	5.0	1.27	0.7	27 0.0	18 56.0	- 0 30.4	-1.2147	0.5760	0.0828	-40	-63
ω <sup>1</sup> Cancrī	6.0	1.22	0.8	25 38.4	21 59.2	+ 2 25.8	-0.0662	0.5742	0.0908	+39	-26
4 Cancrī	6.2	+1.21	+0.9	+25 20.3	22 19.3	+ 2 45.2	+0.2177	0.5740	-0.0917	+56	-11
ψ Cancrī	5.9	1.18	0.2	25 46.9	27 1 54.5	+ 6 12.1	-0.5899	0.5716	0.1009	+10	-57
λ Cancrī	5.9	1.12	0.6	24 18.4	6 7.1	+10 15.3	+0.5020	0.5688	0.1115	+77	+ 2
28 Cancrī	6.1	1.08	0.2	24 26.6	9 30.3	-10 29.0	-0.0332	0.5664	0.1197	+41	-29
v <sup>1</sup> Cancrī	5.7	1.06	0.2	24 23.1	10 43.9	- 9 18.1	-0.1200	0.5655	0.1226	+36	-32
12 <sup>1</sup> Cancrī	6.4	+1.06	+0.1	+24 23.5	11 21.7	- 8 41.7	-0.2045	0.5650	-0.1241	+32	-36
194 B. Cancrī	6.3	0.90	-0.6	23 20.6	28 2 16.1	+ 5 40.6	-1.2063	0.5539	0.1567	-35	-67
ξ Cancrī	5.2	0.88	0.4	22 24.6	3 7.0	+ 6 29.6	-0.3576	0.5532	0.1584	+23	-48
79 Cancrī	6.1	0.88	0.4	22 21.7	3 33.3	+ 6 55.1	-0.3769	0.5528	0.1593	+22	-50
90 H' Cancrī	6.1	0.86	0.3	21 39.3	5 1.0	+ 8 19.7	+0.1340	0.5517	0.1622	+51	-23
57 B. Leonis	6.5	+0.72	-0.7	+19 16.7	19 3.6	- 2 6.4	+0.1873	0.5409	-0.1876	+54	-23
η Leonis	3.6	0.61	0.8	17 12.1	29 5 49.0	+ 8 17.9	+0.2856	0.5330	0.2040	+59	-21
42 Leonis	6.1	0.56	0.8	15 25.8	12 49.7	- 8 54.9	+0.7130	0.5280	0.2134	+90	+ 1
46 Leonis	5.8	0.52	0.9	14 36.0	17 54.6	- 3 59.6	+0.5013	0.5246	0.2195	+74	-11
k Leonis	5.5	+0.47	-1.3	+14 40.2	30 0 59.6	+ 2 52.4	-1.1573	0.5201	-0.2271	-24	-75

NEW MOON.

OCTOBER.

λ Virginis	4.7	+0.28	-5.3	-12 57.5	4 19 32.1	- 5 48.9	+0.9097	0.5012	-0.2274	+77	+ 6
8 Libræ	5.4	0.36	6.2	15 37.5	5 12 20.0	+10 30.3	+0.1833	0.5066	0.2102	+47	-33
α <sup>1</sup> Libræ	2.9	0.36	6.2	15 40.2	12 26.0	+10 36.1	+0.2119	0.5067	0.2101	+48	-32
v Libræ	5.3	0.42	6.4	15 54.6	20 39.7	- 5 24.5	-1.2102	0.5099	0.2001	-36	-90
22 Libræ	6.5	0.42	6.4	16 8.3	20 45.6	- 5 18.8	-0.9768	0.5099	0.2000	-18	-90
26 Libræ	6.3	+0.44	-6.8	-17 26.1	6 0 44.8	- 1 26.7	-0.3250	0.5116	-0.1947	+18	-62
28 Libræ	6.2	0.47	6.9	17 50.0	3 59.8	+ 1 42.6	-0.5076	0.5130	0.1903	+ 8	-75
150 B. Libræ	6.1	0.51	7.4	19 51.6	9 29.5	+ 7 2.4	+0.7165	0.5154	0.1825	+70	- 4
11 H. Libræ	5.4	0.52	7.3	19 22.0	9 56.9	+ 7 29.0	+0.0860	0.5157	0.1818	+38	-38
172 B. Libræ	5.9	0.55	7.6	20 43.3	12 47.0	+10 14.0	+1.0808	0.5170	0.1775	+69	+21
41 Libræ	5.3	+0.55	-7.3	-19 0.5	13 8.0	+10 34.4	-0.8836	0.5171	-0.1770	-15	-90
κ Libræ	5.0	0.56	7.4	19 23.4	14 39.7	-11 56.8	-0.7285	0.5179	0.1747	- 6	-90
λ Libræ	4.9	0.62	7.5	19 54.0	20 20.8	- 6 26.1	-1.1279	0.5206	0.1656	-33	-90
10 G. Scorpīi	5.9	0.64	7.7	20 43.5	22 29.2	- 4 21.6	-0.5639	0.5216	0.1621	+ 2	-81
δ Scorpīi	2.6	0.65	8.1	22 22.1	23 46.3	- 3 6.9	+1.0539	0.5222	0.1599	+68	+20
19 Scorpīi	4.9	+0.76	-8.5	-23 57.3	7 9 40.4	+ 6 28.7	+1.3161	0.5271	-0.1425	+66	+58
ρ Ophiuchi	4.7	0.79	8.2	23 14.5	12 4.7	+ 8 48.4	+0.1876	0.5283	0.1380	+38	-32
126 B. Scorpīi	6.1	0.88	8.4	24 17.8	19 43.7	- 7 47.4	+0.3556	0.5320	0.1233	+45	-23
88 B. Ophiuchi	6.3	1.00	8.4	24 57.5	8 4 22.0	+ 0 34.0	+0.0982	0.5362	0.1058	+30	-37
26 Ophiuchi	5.8	1.00	8.4	24 51.3	4 27.4	+ 0 39.2	-0.0262	0.5363	0.1056	+23	-44
137 B. Ophiuchi	6.3	+1.08	-8.2	-25 8.8	10 4.4	+ 6 5.2	-0.2626	0.5389	-0.0937	+10	-59

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, //	$l'$	$x'$	$y'$	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m				'	'
36 Ophiuchi ( <i>1st star</i> )	5.4	+1.07	- 9.4	-26 28.4	8 11 30.7	+ 7 28.6	+1.0719	0.5395	-0.0906	+64	+24
$\theta$ Ophiuchi	3.3	1.13	7.9	24 54.8	14 35.3	+10 27.0	-0.9214	0.5409	0.0838	-28	-90
136 G. Ophiuchi	6.3	1.17	8.1	25 52.0	16 49.4	-11 23.4	-0.0497	0.5418	0.0788	+19	-46
151 G. Ophiuchi	6.0	1.20	8.1	26 12.2	19 1.2	- 9 16.1	+0.1545	0.5427	0.0738	+29	-34
4 G. Sagittarii	6.2	1.32	8.0	26 56.7	9 2 35.6	- 1 57.2	+0.4780	0.5457	0.0565	+47	-16
66 B. Sagittarii	4.7	+1.52	- 7.0	-27 4.7	15 50.1	+10 50.0	+0.0831	0.5500	-0.0247	+21	-38
68 G. Sagittarii	6.2	1.58	6.6	26 41.4	20 7.9	- 9 1.2	-0.4242	0.5511	0.0142	- 7	-71
69 G. Sagittarii	6.3	1.58	6.6	26 48.8	20 17.7	- 8 51.8	-0.2919	0.5512	0.0138	0	-61
86 B. Sagittarii	6.5	1.58	6.5	26 38.5	20 40.4	- 8 29.9	-0.4853	0.5513	-0.0128	-10	-76
$\phi$ Sagittarii	3.3	1.70	6.0	27 5.1	10 4 1.5	- 1 24.2	-0.0261	0.5530	+0.0055	+13	-45
$\sigma$ Sagittarii	2.3	+1.75	- 5.4	-26 24.6	8 15.5	+ 2 40.9	-0.7154	0.5537	+0.0161	-22	-90
$\tau$ Sagittarii	3.5	1.84	5.5	27 48.3	13 20.9	+ 7 35.4	+0.9150	0.5544	0.0290	+62	+12
201 B. Sagittarii	5.9	1.86	4.4	26 3.6	16 7.6	+10 16.2	-0.8894	0.5547	0.0360	-30	-90
248 B. Sagittarii	5.7	1.98	4.0	27 10.3	23 22.2	- 6 44.6	+0.6420	0.5551	0.0542	+58	- 6
$\omega$ Sagittarii	4.8	2.14	2.3	26 32.4	11 10 42.2	+ 4 11.2	+0.7324	0.5552	0.0826	+63	- 1
A Sagittarii	4.9	+2.15	- 2.1	-26 26.4	12 4.4	+ 5 30.5	+0.7407	0.5551	+0.0859	+64	0
40 B. Capricorni	6.2	2.32	+ 0.2	25 14.9	12 2 56.6	- 4 8.9	+1.0053	0.5537	0.1218	+65	+17
56 B. Capricorni	6.3	2.36	1.5	24 6.2	6 9.3	- 1 3.0	+0.1891	0.5533	0.1293	+36	-32
86 B. Capricorni	6.2	2.40	1.8	24 7.2	11 49.7	+ 4 25.4	+0.9760	0.5523	0.1423	+66	+14
$\lambda$ Capricorni	5.3	2.43	3.7	21 33.3	18 44.7	+11 6.0	-0.6975	0.5511	0.1576	- 7	-90
27 Capricorni	6.1	+2.43	+ 3.9	-20 55.0	19 11.3	+11 31.7	-1.2992	0.5510	+0.1585	-55	-90
$\phi$ Capricorni	5.3	2.45	4.3	21 1.5	21 53.6	- 9 51.8	-0.7474	0.5504	0.1643	- 9	-90
33 Capricorni	5.3	2.49	4.7	21 14.0	13 1 41.6	- 6 11.7	+0.1124	0.5496	0.1723	+37	-37
35 Capricorni	6.0	2.51	4.8	21 35.1	3 4.1	- 4 52.1	+0.7200	0.5493	0.1752	+68	- 3
128 B. Capricorni	6.5	2.49	5.6	19 32.4	4 19.0	- 3 39.8	-1.2036	0.5492	0.1777	-40	-90
37 Capricorni	5.7	+2.52	+ 5.6	-20 29.1	6 29.0	- 1 34.2	+0.1764	0.5487	+0.1821	+41	-33
$\epsilon$ Capricorni	4.7	2.52	6.0	19 52.1	7 29.2	- 0 36.2	-0.2843	0.5486	0.1841	+18	-60
$\kappa$ Capricorni	4.8	2.54	6.5	19 16.5	9 59.4	+ 1 48.8	-0.4360	0.5480	0.1890	+10	-70
143 B. Capricorni	6.1	2.56	6.3	20 1.8	10 14.5	+ 2 3.5	+0.3996	0.5479	0.1895	+54	-21
154 B. Capricorni	6.1	2.58	7.1	19 2.4	14 3.7	+ 5 44.8	+0.1055	0.5471	0.1967	+39	-37
161 B. Capricorni	6.4	+2.60	+ 7.9	-18 20.0	18 48.7	+10 20.0	+0.3260	0.5462	+0.2055	+52	-25
29 Aquarii ( <i>mean</i> )	6.5	2.58	8.3	17 23.8	18 56.1	+10 27.1	-0.6209	0.5462	0.2057	+ 3	-85
56 Aquarii	6.1	2.64	10.5	15 2.6	14 7 36.9	- 1 17.8	-0.3005	0.5438	0.2269	+22	-60
69 Aquarii	5.6	2.69	11.6	14 31.7	15 35.8	+ 6 24.9	+1.0280	0.5426	0.2386	+75	+14
$\tau$ Aquarii	4.4	2.68	11.8	14 3.9	16 27.9	+ 7 15.2	+0.7612	0.5425	0.2398	+73	- 2
74 Aquarii	5.8	+2.67	+12.5	-12 5.5	18 15.5	+ 8 59.2	-0.8210	0.5423	+0.2422	- 4	-90
257 B. Aquarii	6.3	2.70	12.6	13 33.0	21 3.9	+11 42.0	+1.3500	0.5420	0.2459	+76	+45
290 B. Aquarii	6.3	2.72	13.8	11 10.4	15 4 1.2	- 5 34.7	+0.6707	0.5415	0.2542	+78	- 8
$\psi^1$ Aquarii	4.5	2.72	14.2	9 34.4	4 34.3	- 5 2.7	-0.8112	0.5414	0.2548	- 2	-90
$\psi^2$ Aquarii	4.6	2.70	14.3	9 40.2	5 30.9	- 4 8.1	-0.4727	0.5414	0.2559	+16	-71
$\psi^3$ Aquarii	5.2	+2.71	+14.2	-10 5.9	6 0.0	- 3 39.9	+0.0863	0.5414	+0.2563	+45	-38
336 B. Aquarii	6.3	2.73	14.8	9 45.4	10 38.7	+ 0 49.4	+0.9409	0.5412	0.2611	+80	+ 8
351 B. Aquarii	6.5	2.73	15.4	7 57.5	13 39.4	+ 3 44.1	-0.0838	0.5412	0.2639	+37	-48
376 B. Aquarii	6.3	2.74	16.1	6 52.5	19 39.7	+ 9 32.3	+0.4265	0.5415	0.2689	+66	-21
27 Piscium	5.1	2.73	16.9	4 3.0	16 0 20.2	- 9 56.5	-1.1422	0.5418	0.2722	-22	-90
29 Piscium	5.1	+2.74	+17.1	- 3 31.4	1 47.1	- 8 32.6	-1.2741	0.5419	+0.2730	-33	-90
4 Ceti	6.3	2.75	17.4	3 2.7	4 30.3	- 5 54.9	-1.0068	0.5423	0.2746	-12	-90
5 Ceti	6.3	2.75	17.4	2 56.6	4 43.3	- 5 42.2	-1.0489	0.5423	0.2747	-15	-90
54 B. Ceti	6.3	2.77	17.8	2 42.7	12 12.1	+ 1 31.5	+0.7878	0.5435	0.2777	+87	- 2
10 Ceti	6.4	2.77	18.2	0 32.6	13 10.1	+ 2 27.5	-1.1030	0.5437	0.2781	-17	-90
14 Ceti	5.4	+2.79	+18.3	- 0 59.7	17 14.6	+ 6 23.7	+0.4823	0.5445	+0.2790	+72	-18
77 Piscium	6.4	2.81	19.1	+ 4 26.1	17 6 56.5	+ 4 22.3	-1.0677	0.5486	0.2789	-16	-86
263 B. Piscium	6.4	2.82	19.4	7 30.0	16 59.0	+ 5 19.4	-1.3035	0.5526	0.2753	-36	-82
$\mu$ Piscium	5.0	2.84	19.3	5 41.1	17 47.2	+ 6 5.9	+0.7051	0.5530	0.2749	+90	- 5
$\nu$ Piscium	4.4	2.84	19.3	8 42.6	18 0 27.8	-11 27.6	-0.4499	0.5561	0.2706	+20	-67
29 Arietis	6.1	+2.88	+18.3	+14 38.5	20 46.6	+ 8 7.2	-0.9740	0.5672	+0.2490	-11	-75



## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, $H$	$l'$	$x'$	$y'$	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
o Arietis	5.8	+2.89	+17.9	+14 56.2	19 1 38.1	-11 12.0	-0.0704	0.5702	+0.2418	+39	-41
$\sigma$ Arietis	5.5	2.89	17.7	14 43.0	4 30.6	-8 26.1	+0.8340	0.5719	0.2373	+90	+7
124 B. Arietis	6.4	2.90	17.5	16 7.3	5 11.6	-7 46.5	-0.3831	0.5723	0.2361	+23	-57
145 B. Arietis	6.5	2.89	17.1	15 30.7	9 54.7	-3 14.2	+1.3109	0.5752	0.2279	+90	+47
53 Arietis	6.0	2.91	16.9	17 32.3	11 0.6	-2 10.8	-0.4298	0.5759	0.2259	+20	-59
54 Arietis	6.5	+2.92	+16.7	+18 27.3	11 22.4	-1 49.8	-1.2489	0.5762	+0.2253	-35	-72
175 B. Arietis	6.4	2.91	16.0	18 26.8	18 54.7	+5 25.0	+0.4024	0.5808	0.2104	+68	-13
14 H'. Tauri	6.5	2.93	15.1	20 37.6	23 38.4	+9 57.7	-0.7726	0.5835	0.2001	0	-69
13 Tauri	5.6	2.91	15.2	19 25.0	20 0 58.0	+11 14.1	+0.6824	0.5842	0.1972	+90	+3
14 Tauri	6.2	2.92	15.1	19 23.1	1 32.5	+11 47.3	+0.8267	0.5846	0.1958	+90	+11
22 H'. Tauri	6.1	+2.92	+14.9	+20 39.0	1 47.9	-11 58.0	-0.3677	0.5848	+0.1953	+23	-53
133 B. Tauri	5.9	2.94	14.3	21 58.5	3 55.5	-9 55.5	-1.2640	0.5860	0.1903	-40	-68
32 Tauri	5.8	2.94	13.9	22 13.4	6 38.4	-7 19.0	-1.0017	0.5875	0.1839	-15	-68
A' Tauri	4.6	2.92	13.6	21 50.4	9 41.5	-4 23.2	-0.0750	0.5891	0.1763	+39	-34
39 Tauri	6.1	2.93	13.5	21 46.2	9 56.3	-4 9.1	+0.0375	0.5892	0.1757	+45	-28
192 B. Tauri	6.1	+2.91	+13.1	+22 11.2	12 51.0	-1 21.4	+0.1275	0.5907	+0.1682	+50	-22
51 Tauri	5.6	2.90	13.0	21 21.8	14 59.4	+0 41.9	+1.2953	0.5918	0.1627	+90	+56
56 Tauri	5.2	2.89	12.9	21 33.6	15 27.7	+1 9.0	+1.1773	0.5920	0.1614	+90	+41
62 Tauri	6.1	2.93	12.1	24 5.7	17 6.6	+2 43.9	-1.0674	0.5927	0.1570	-21	-66
$\kappa$ Tauri	4.1	2.89	12.4	22 5.5	17 39.6	+3 15.5	+1.0005	0.5929	0.1555	+90	+27
67 Tauri	5.4	+2.89	+12.5	+21 59.9	17 40.8	+3 16.7	+1.0964	0.5929	+0.1554	+90	+34
$\nu$ Tauri	4.2	2.90	12.3	22 36.8	18 0.7	+3 35.8	+0.5392	0.5931	0.1545	+79	0
72 Tauri	5.4	2.90	12.2	22 47.9	18 23.4	+3 57.5	+0.4154	0.5933	0.1535	+69	-7
284 B. Tauri	6.0	2.90	11.5	23 9.6	21 53.4	+7 19.0	+0.5768	0.5947	0.1438	+83	+3
$\tau$ Tauri	4.5	2.87	11.4	22 47.3	21 0 5.4	+9 25.6	+1.2563	0.5956	0.1376	+90	+52
95 Tauri	6.2	+2.89	+11.0	+23 55.3	0 26.8	+9 46.2	+0.1807	0.5957	+0.1366	+54	-17
300 B. Tauri	6.2	2.87	11.0	23 28.0	1 23.6	+10 40.6	+0.7607	0.5960	0.1339	+90	+14
315 B. Tauri	6.3	2.86	10.1	24 27.1	5 22.2	-9 30.6	+0.2926	0.5973	0.1223	+61	-10
99 Tauri	6.0	2.85	10.2	23 48.7	5 57.8	-8 56.5	+1.0014	0.5974	0.1205	+90	+31
$\lambda$ Tauri	5.6	2.87	9.9	24 54.9	6 4.6	-8 50.0	-0.0819	0.5975	0.1201	+38	-29
103 Tauri	5.5	+2.83	+9.5	+24 9.0	9 50.2	-5 13.8	+1.1113	0.5985	+0.1090	+90	+40
118 Tauri	5.4	2.79	7.9	25 4.8	17 45.3	+2 21.5	+0.9535	0.5999	0.0847	+90	+31
112 B. Aurigæ	5.7	2.80	6.9	26 52.2	20 40.1	+5 9.0	-0.6033	0.6001	0.0756	+9	-56
125 Tauri	5.1	2.77	7.0	25 51.0	21 39.2	+6 5.7	+0.4921	0.6001	0.0725	+76	+5
136 Tauri	4.6	2.76	5.6	27 35.6	22 2 42.2	+10 55.9	-0.9314	0.6000	0.0565	-13	-62
139 Tauri	4.7	+2.71	+5.8	+25 56.7	4 28.5	-11 22.3	+0.8191	0.5999	+0.0509	+90	+25
415 B. Tauri	6.1	2.73	5.1	27 34.2	5 34.5	-10 19.0	-0.7600	0.5998	0.0474	-1	-62
49 Aurigæ	5.1	2.60	2.7	28 5.6	18 24.2	+1 58.6	-0.9489	0.5970	0.0066	-15	-62
54 Aurigæ	5.8	2.59	2.4	28 20.6	20 2.6	+3 33.0	-1.1966	0.5965	+0.0014	-39	-62
39 Geminorum	6.2	2.45	1.9	26 12.0	23 3 23.8	+10 36.0	+0.9057	0.5933	-0.0214	+90	+33
40 Geminorum	6.3	+2.45	+1.8	+26 2.3	3 39.0	+10 50.5	+1.0662	0.5932	-0.0222	+90	+44
47 Geminorum	5.6	2.41	0.7	27 0.3	8 12.6	-8 47.0	-0.0519	0.5909	0.0361	+40	-20
53 Geminorum	5.9	2.41	0.1	28 3.3	9 57.4	-7 6.5	-1.1917	0.5899	0.0414	-38	-62
134 B. Geminorum	6.5	2.39	+0.4	26 51.1	10 24.0	-6 40.9	+0.0179	0.5896	0.0427	+44	-17
59 Geminorum	5.7	2.36	-0.3	27 48.8	13 17.9	+3 54.0	-1.1011	0.5879	0.0512	-27	-62
$\nu$ Geminorum	4.3	+2.29	-0.9	+27 5.8	17 45.5	+0 22.9	-0.6267	0.5850	-0.0642	+7	-57
$\epsilon$ Geminorum	5.5	2.22	0.9	25 59.9	21 0.4	+3 30.1	+0.2770	0.5828	0.0734	+60	-6
$\phi$ Geminorum	5.0	2.19	1.8	26 59.9	24 0 43.7	+7 4.7	-1.0459	0.5800	0.0837	-22	-63
$\omega^1$ Cancri	6.0	2.13	1.8	25 38.4	3 44.0	+9 58.0	+0.0920	0.5777	0.0918	+48	-17
4 Cancri	6.2	2.11	1.7	25 20.2	4 3.7	+10 17.0	+0.3736	0.5776	0.0926	+67	-3
$\psi$ Cancri	5.9	+2.07	-2.6	+25 46.8	7 35.7	-10 19.3	-0.4282	0.5746	-0.1019	+19	-47
$\lambda$ Cancri	5.9	1.99	2.4	24 18.3	11 44.8	-6 19.6	+0.6546	0.5713	0.1125	+90	+10
28 Cancri	6.1	1.95	3.0	24 26.6	15 5.6	-3 6.3	+0.1226	0.5685	0.1206	+50	-19
$\nu^1$ Cancri	5.7	1.93	3.1	24 23.1	16 18.4	-1 56.2	+0.0360	0.5673	0.1235	+45	-24
$\iota^a$ Cancri	6.4	1.92	3.2	24 23.4	16 55.8	-1 20.2	-0.0481	0.5668	0.1250	+40	-28
194 B. Cancri	6.3	+1.70	-4.5	+23 20.5	25 7 43.1	-11 5.1	-1.0513	0.5539	-0.1574	-20	-67

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

## OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
$\xi$ Cancr	5.2	+1.69	-4.3	+22 24.5	25 8 33.7	-10 16.3	-0.2065	0.5532	-0.1592	+32	-40
79 Cancr	6.1	1.68	4.3	22 21.7	8 59.8	-9 51.1	-0.2260	0.5528	0.1600	+31	-41
90 H' Cancr	6.1	1.65	4.2	21 39.2	10 27.2	-8 26.8	+0.2823	0.5514	0.1628	+60	-15
57 B. Leonis	6.5	1.45	4.8	19 16.6	26 0 28.1	+5 5 5	+0.3283	0.5393	0.1878	+63	-16
$\eta$ Leonis	3.6	1.30	5.0	17 12.0	11 14.7	-8 29.1	+0.4194	0.5305	0.2040	+68	-14
42 Leonis	6.1	+1.21	-5.0	+15 25.7	18 17.2	-1 40.0	+0.8416	0.5250	-0.2132	+90	+8
46 Leonis	5.8	1.15	5.1	14 35.9	23 23.8	+3 17.0	+0.6259	0.5213	0.2192	+85	-5
<i>k</i> Leonis	5.5	1.07	5.7	14 40.1	27 6 31.7	+10 11.8	-1.0406	0.5165	0.2267	-15	-75
$\omega$ Virginis	5.4	0.80	5.5	8 37.9	28 9 42.0	-11 25.6	-0.9881	0.5020	0.2463	-10	-81
$\nu$ Virginis	4.2	0.76	5.5	7 1.9	13 41.0	-7 33.4	-0.2373	0.5006	0.2480	+31	-55
<i>b</i> Virginis	5.2	+0.69	-5.0	+4 9.3	21 19.7	-0 7.6	+0.9870	0.4979	-0.2508	+90	+11
$\gamma$ Virginis ( <i>mean</i> )	2.9	0.51	5.0	-0 57.4	29 20 20.7	-1 44.5	+0.7654	0.4935	0.2534	+89	-3
<i>k</i> Virginis	5.7	0.49	5.1	3 19.7	30 6 19.1	+7 57.6	+0.8503	0.4932	0.2520	+87	+2
46 Virginis	6.1	0.49	5.1	2 53.2	6 50.6	+8 28.2	+0.2320	0.4932	0.2519	+56	-31
48 Virginis	6.5	+0.48	-5.2	-3 10.8	8 41.1	+10 15.7	+0.0925	0.4932	-0.2515	+48	-38

NEW MOON.

## NOVEMBER.

19 Scorpii	4.9	+0.58	-7.4	-23 57.3	3 16 10.2	-9 14.0	+1.2519	0.5285	-0.1435	+66	+41
$\rho$ Ophiuchi	4.7	0.60	7.3	23 14.5	18 34.3	-6 54.5	+0.1198	0.5297	0.1390	+34	-36
126 B. Scorpii	6.1	0.66	7.4	24 17.8	4 2 13.1	+0 29.5	+0.2843	0.5333	0.1242	+41	-27
88 B. Ophiuchi	6.3	0.74	7.4	24 57.5	10 51.6	+8 51.1	+0.0223	0.5372	0.1065	+25	-42
26 Ophiuchi	5.8	0.74	7.4	24 51.3	10 57.0	+8 56.3	-0.1025	0.5372	0.1063	+19	-49
118 B. Ophiuchi	6.2	+0.77	-7.7	-26 23.6	14 3.8	+11 57.0	+1.2857	0.5386	-0.0997	+64	+54
137 B. Ophiuchi	6.3	0.80	7.4	25 8.8	16 34.3	-9 37.5	-0.3420	0.5396	0.0942	+6	-64
36 Ophiuchi ( <i>1st star</i> )	5.4	0.78	8.6	26 28.4	18 0.8	-8 13.8	+0.9967	0.5402	0.0911	+64	+17
$\theta$ Ophiuchi	3.3	0.84	7.2	24 54.7	21 5.7	-5 15.1	-1.0052	0.5414	0.0843	-33	-90
136 G. Ophiuchi	6.3	0.86	7.3	25 52.0	23 20.2	-3 5.2	-0.1308	0.5422	0.0793	+15	-51
151 G. Ophiuchi	6.0	+0.89	-7.3	-26 12.2	5 1 32.3	-0 57.4	+0.0735	0.5430	-0.0743	+25	-39
4 G. Sagittarii	6.2	0.98	7.2	26 56.7	9 8.4	+6 23.2	+0.3966	0.5455	0.0568	+41	-20
66 B. Sagittarii	4.7	1.13	6.6	27 4.6	22 27.6	-4 44.9	-0.0034	0.5489	0.0249	+16	-44
68 G. Sagittarii	6.2	1.18	6.3	26 41.4	6 2 47.5	-0 34.0	-0.5148	0.5496	0.0143	-11	-78
69 G. Sagittarii	6.3	1.19	6.3	26 48.8	2 57.4	-0 24.5	-0.3816	0.5497	0.0139	-4	-68
86 B. Sagittarii	6.5	+1.18	-6.2	-26 38.5	3 20.2	-0 2.6	-0.5763	0.5497	-0.0130	+15	-85
$\phi$ Sagittarii	3.3	1.29	5.9	27 5.1	10 45.7	+7 7.5	-0.1151	0.5507	+0.0053	+9	-50
$\sigma$ Sagittarii	2.3	1.33	5.4	26 24.6	15 2.5	+11 15.4	-0.8103	0.5510	0.0159	-27	-90
$\tau$ Sagittarii	3.5	1.41	5.6	27 48.3	20 11.8	-7 46.1	+0.8331	0.5512	0.0287	+62	+6
201 B. Sagittarii	5.9	1.43	4.6	26 3.6	23 0.8	-5 3.0	-0.9871	0.5513	0.0357	-37	-90
248 B. Sagittarii	5.7	+1.54	-4.4	-27 10.3	7 6 22.2	+2 3.0	+0.5581	0.5510	+0.0538	+51	-11
$\omega$ Sagittarii	4.8	1.70	3.0	26 32.4	17 54.5	-10 48.9	+0.6502	0.5498	0.0818	+60	-6
<i>A</i> Sagittarii	4.9	1.71	2.9	26 26.4	19 18.3	-9 27.9	+0.6588	0.5496	0.0851	+60	-5
40 B. Capricorni	6.2	1.88	-1.0	25 14.9	8 10 30.6	+5 12.8	+0.9293	0.5468	0.1204	+65	+12
56 B. Capricorni	6.3	1.93	+0.2	24 6.2	13 48.2	+8 23.6	+0.1035	0.5460	0.1278	+32	-37
86 B. Capricorni	6.2	+1.98	+0.4	-24 7.2	19 37.5	-9 59.1	+0.9018	0.5446	+0.1405	+66	+9
$\chi$ Capricorni	5.3	2.02	2.0	21 33.3	9 2 44.1	-3 6.9	-0.7927	0.5428	0.1555	-12	-90
$\phi$ Capricorni	5.3	2.05	2.6	21 1.5	5 58.5	+0 1.0	-0.8426	0.5420	0.1621	-15	-90
33 Capricorni	5.3	2.10	2.9	21 14.0	9 53.2	+3 47.7	+0.0303	0.5409	0.1699	+32	-41
35 Capricorni	6.0	2.12	3.0	21 35.1	11 18.2	+5 9.9	+0.6470	0.5406	0.1727	+66	-8
128 B. Capricorni	6.5	+2.10	+3.9	-19 32.4	12 35.3	+6 24.4	-1.3038	0.5402	+0.1751	-53	-90
37 Capricorni	5.7	2.14	3.8	20 29.1	14 49.4	+8 34.0	+0.0966	0.5396	0.1794	+37	-38
$\epsilon$ Capricorni	4.7	2.14	4.2	19 52.1	15 51.5	+9 34.0	-0.3704	0.5393	0.1813	+13	-65
$\kappa$ Capricorni	4.8	2.17	4.6	19 16.5	18 26.4	-11 50.3	-0.5234	0.5387	0.1861	+6	-77
143 B. Capricorni	6.1	2.18	4.4	20 1.9	18 41.9	-11 41.2	+0.3244	0.5386	0.1866	+50	-26
154 B. Capricorni	6.1	+2.21	+5.1	-19 2.5	22 38.4	-7 52.6	+0.0274	0.5377	+0.1937	+35	-42

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, //	y'	x'	y'	N.	S.
		Δα	Δδ		d h m	h m				°	°
161 B. Capricorni	6.4	+2.25	+ 5.9	-18 20.1	10 3 32.6	- 3 8.2	+0.2529	0.5365	+0.2022	+48	-29
29 Aquarii ( <i>mean</i> )	6.5	2.23	6.3	17 23.8	3 40.3	- 3 0.8	-0.7079	0.5365	0.2025	- 2	-90
56 Aquarii	6.1	2.34	8.5	15 2.6	16 46.2	+ 9 39.4	-0.3772	0.5339	0.2232	+18	-65
69 Aquarii	5.6	2.41	9.5	14 31.7	11 1 1.0	- 6 22.0	+0.9745	0.5327	0.2348	+75	+11
7 Aquarii	4.4	2.41	9.7	14 3.9	1 54.7	- 5 30.1	+0.7044	0.5326	0.2360	+76	- 6
74 Aquarii	5.8	+2.40	+10.6	-12 5.5	3 45.9	- 3 42.5	-0.8997	0.5324	+0.2384	- 9	-90
257 B. Aquarii	6.3	2.44	10.4	13 33.0	6 39.8	- 0 54.2	+1.3038	0.5322	0.2420	+76	+38
290 B. Aquarii	6.3	2.48	11.8	11 10.5	13 50.6	+ 6 2.7	+0.6184	0.5318	0.2503	+76	-11
ψ <sup>1</sup> Aquarii	4.5	2.49	12.4	9 34.5	14 24.8	+ 6 35.8	-0.8833	0.5318	0.2509	- 6	-90
ψ <sup>2</sup> Aquarii	4.6	2.48	12.4	9 40.2	15 23.2	+ 7 32.2	-0.5397	0.5318	0.2519	+13	-77
ψ <sup>3</sup> Aquarii	5.2	+2.49	+12.4	-10 6.0	15 53.2	+ 8 1.3	+0.0273	0.5318	+0.2525	+42	-42
336 B. Aquarii	6.3	2.53	12.8	9 45.5	20 40.6	-11 20.6	+0.8959	0.5319	0.2572	+80	+ 5
351 B. Aquarii	6.5	2.54	13.7	7 57.5	23 46.8	- 8 20.4	-0.1404	0.5321	0.2601	+34	-51
376 B. Aquarii	6.3	2.58	14.4	6 52.6	12 5 57.8	- 2 21.4	+0.3799	0.5326	0.2651	+63	-23
27 Piscium	5.1	2.60	15.5	4 3.1	10 46.2	+ 2 17.7	-1.2038	0.5333	0.2685	-27	-90
29 Piscium	5.1	+2.61	+15.8	- 3 31.4	12 15.4	+ 3 43.9	-1.3361	0.5336	+0.2694	-40	-90
4 Ceti	6.3	2.63	16.1	3 2.7	15 3.0	+ 6 26.1	-1.0636	0.5342	0.2711	-16	-90
5 Ceti	6.3	2.63	16.2	2 56.6	15 16.3	+ 6 39.0	-1.1059	0.5342	0.2712	-19	-90
54 B. Ceti	6.3	2.69	16.6	2 42.7	22 56.2	- 9 56.1	+0.7550	0.5361	0.2747	+87	- 4
10 Ceti	6.4	2.69	17.2	0 32.6	23 55.6	- 8 58.8	-1.1533	0.5364	0.2750	-22	-90
14 Ceti	5.4	+2.73	+17.3	- 0 59.7	13 4 5.5	- 4 57.1	+0.4497	0.5378	+0.2763	+70	-20
77 Piscium	6.4	2.82	18.8	+ 4 26.1	18 2.7	+ 8 32.2	-1.1015	0.5435	0.2770	-18	-86
263 B. Piscium	6.4	2.90	19.5	7 30.0	4 13.2	- 5 38.1	-1.3292	0.5490	0.2742	-39	-82
μ Piscium	5.0	2.92	19.2	5 41.1	5 1.8	- 4 51.2	+0.6881	0.5495	0.2738	+90	- 6
ν Piscium	4.4	2.97	19.6	8 42.6	11 45.9	+ 1 38.8	-0.4663	0.5536	0.2701	+19	-68
SATURN				+ 9 29.2	20 53.4	+10 26.9	+1.2025	0.5628	+0.2638	+90	+29
29 Arietis	6.1	+3.14	+19.4	14 38.5	15 8 6.3	- 2 44.8	-0.9744	0.5682	0.2500	-11	-75
o Arietis	5.8	3.18	18.9	14 56.2	12 56.2	+ 1 54.3	-0.0701	0.5720	0.2432	+39	-41
σ Arietis	5.5	3.20	18.7	14 43.0	15 47.5	+ 4 39.1	+0.8321	0.5742	0.2388	+90	+ 7
124 B. Arietis	6.4	3.22	18.7	16 7.3	16 28.2	+ 5 18.3	-0.3796	0.5748	0.2377	+23	-57
145 B. Arietis	6.5	+3.24	+18.1	+15 30.7	21 8.5	+ 9 47.9	+1.3082	0.5785	+0.2298	+90	+47
53 Arietis	6.0	3.27	18.2	17 32.3	22 13.6	+10 50.5	-0.4225	0.5794	0.2278	+21	-58
54 Arietis	6.5	3.29	18.2	18 27.3	22 35.1	+11 11.1	-1.2367	0.5797	0.2271	-34	-72
175 B. Arietis	6.4	3.33	17.3	18 26.8	16 6 1.3	- 5 40.1	+0.4080	0.5856	0.2126	+68	-13
14 H'. Tauri	6.5	3.39	16.6	20 37.7	10 40.2	- 1 12.2	-0.7555	0.5891	0.2025	+ 2	-69
13 Tauri	5.6	+3.37	+16.4	+19 25.0	11 58.3	+ 0 2.7	+0.6877	0.5901	+0.1995	+90	+ 3
14 Tauri	6.2	3.38	16.3	19 23.1	12 32.3	+ 0 35.4	+0.8309	0.5905	0.1982	+90	+12
22 H'. Tauri	6.1	3.40	16.3	20 39.0	12 47.4	+ 0 49.8	-0.3529	0.5907	0.1977	+24	-51
133 B. Tauri	5.9	3.43	15.9	21 58.5	14 52.5	+ 2 49.8	-1.2400	0.5923	0.1928	-37	-68
32 Tauri	5.8	3.45	15.4	22 13.4	17 32.0	+ 5 22.9	-0.9786	0.5942	0.1863	-14	-68
A <sup>1</sup> Tauri	4.6	+3.45	+15.0	+21 50.4	20 31.2	+ 8 14.8	-0.0597	0.5963	+0.1788	+40	-33
39 Tauri	6.1	3.46	14.9	21 46.2	20 45.7	+ 8 28.6	+0.0518	0.5964	0.1782	+46	-27
192 B. Tauri	6.1	3.46	14.5	22 11.2	23 36.3	+11 12.2	+0.1418	0.5983	0.1707	+51	-22
51 Tauri	5.6	3.46	14.2	21 21.8	17 1 41.6	-10 47.7	+1.2969	0.5997	0.1651	+90	+56
56 Tauri	5.2	3.46	14.1	21 33.6	2 9.2	-10 21.2	+1.1803	0.6000	0.1639	+90	+41
62 Tauri	6.1	+3.52	+13.6	+24 5.7	3 45.6	- 8 48.9	-1.0379	0.6010	+0.1595	-19	-66
κ Tauri	4.1	3.48	13.6	22 5.5	4 17.8	- 8 18.1	+1.0058	0.6013	0.1580	+90	+27
67 Tauri	5.4	3.48	13.6	21 59.9	4 19.0	- 8 16.9	+1.1006	0.6013	0.1579	+90	+35
ν Tauri	4.2	3.49	13.5	22 36.8	4 38.4	- 7 58.3	+0.5501	0.6015	0.1570	+80	0
72 Tauri	5.4	3.49	13.5	22 47.9	5 0.5	- 7 37.2	+0.4278	0.6017	0.1560	+70	- 6
284 B. Tauri	6.0	+3.51	+12.7	+23 9.7	8 25.0	- 4 21.2	+0.5880	0.6036	+0.1463	+84	+ 3
τ Tauri	4.5	3.50	12.4	22 47.3	10 33.3	- 2 18.4	+1.2593	0.6048	0.1400	+90	+53
95 Tauri	6.2	3.52	12.2	23 55.3	19 54.0	- 1 58.5	+0.1975	0.6049	0.1390	+55	-16
300 B. Tauri	6.2	3.51	12.1	23 28.0	11 49.2	- 1 5.7	+0.7702	0.6054	0.1362	+90	+15
315 B. Tauri	6.3	3.54	11.2	24 27.1	15 41.0	+ 2 36.3	+0.3091	0.6071	0.1245	+62	- 8
99 Tauri	6.0	+3.52	+11.1	+23 48.7	16 15.5	+ 3 9.3	+1.0083	0.6074	+0.1228	+90	+31

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.													
NOVEMBER.													
THE STAR'S					AT CONJUNCTION IN R. A.					Limiting			
Name	Mag.	Red'ns from 1910.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, $H$		$Y'$	$x'$	$y'$	N.	S.	
		$\Delta\alpha$	$\Delta\delta$										
		s	"	°	d h m	h m					°	'	"
$k$ Tauri	5.6	+3.55	+11.0	+24 54.9	17 16 22.1	+ 3 15.6	-0.0601	0.6074	+0.1224	+40 -28			
103 Tauri	5.5	3.53	10.3	24 9.0	20 0.8	+ 6 44.9	+1.1171	0.6088	0.1111	+90 +41			
118 Tauri	5.4	3.54	8.5	25 4.8	18 3 40.7	- 9 55.1	+0.9622	0.6108	0.0864	+90 +31			
112 B. Aurigæ	5.7	3.58	7.5	26 52.2	6 29.7	- 7 13.4	-0.5703	0.6112	0.0771	+11 -54			
125 Tauri	5.1	3.55	7.5	25 51.0	7 26.8	- 6 18.8	+0.5083	0.6113	0.0740	+78 + 6			
136 Tauri	4.6	+3.58	+ 6.0	+27 35.6	12 19.4	- 1 38.9	-0.8919	0.6116	+0.0577	-10 -62			
139 Tauri	4.7	3.52	6.0	25 56.7	14 2.0	- 0 0.8	+0.8307	0.6115	0.0520	+90 +26			
415 B. Tauri	6.1	3.56	5.4	27 34.2	15 5.7	+ 1 0.2	-0.7227	0.6115	0.0484	+ 1 -62			
49 Aurigæ	5.1	3.50	2.2	28 5.6	19 3 27.7	-11 9.9	-0.9065	0.6090	0.0068	-11 -62			
54 Aurigæ	5.8	3.49	1.8	28 20.6	5 2.5	- 9 39.2	-1.1498	0.6084	+0.0015	-33 -62			
39 Geminorum	6.2	+3.36	+ 0.8	+26 12.0	12 7.7	- 2 52.2	-0.9173	0.6052	-0.0219	+90 +34			
40 Geminorum	6.3	3.36	+ 0.6	26 2.2	12 22.3	- 2 38.3	+1.0751	0.6051	0.0227	+90 +44			
47 Geminorum	5.6	3.34	- 0.7	27 0.3	16 45.9	+ 1 34.2	-0.0238	0.6026	0.0368	+42 -18			
53 Geminorum	5.9	3.35	1.3	28 3.3	18 26.9	+ 3 10.9	-1.1442	0.6016	0.0422	-32 -62			
134 B. Geminorum	6.5	3.32	1.2	26 51.1	18 52.5	+ 3 35.5	+0.0449	0.6013	0.0435	+46 -15			
59 Geminorum	5.7	+3.31	- 2.0	+27 48.7	21 40.1	+ 6 16.1	-1.0550	0.5994	-0.0523	-23 -62			
$i$ Geminorum	3.8	3.30	2.2	27 58.6	22 6.6	+ 6 41.4	-1.2448	0.5991	0.0536	-47 -62			
$v$ Geminorum	4.3	3.24	2.8	27 5.7	20 1 58.1	+10 23.3	-0.5887	0.5963	0.0655	-10 -54			
$c$ Geminorum	5.5	3.17	3.1	25 59.9	5 6.2	-10 36.4	+0.2997	0.5938	0.0748	+62 - 5			
$\phi$ Geminorum	5.0	3.16	4.2	26 59.9	8 41.6	- 7 9.7	-1.0012	0.5908	0.0853	-18 -63			
$\omega^*$ Cancri	6.0	+3.09	- 4.4	+25 38.3	11 35.6	- 4 22.7	+0.1178	0.5883	-0.0935	+50 -16			
$\delta$ Cancri	6.2	3.08	4.3	25 20.2	11 54.7	- 4 4.4	+0.3946	0.5880	0.0944	+68 - 2			
$\phi$ Cancri	5.9	3.04	5.5	25 46.8	15 19.4	- 0 47.9	-0.3941	0.5849	0.1038	+21 -45			
$\lambda$ Cancri	5.9	2.95	5.5	24 18.3	19 20.4	+ 3 3.7	+0.6712	0.5811	0.1145	+90 +10			
28 Cancri	6.1	2.91	6.2	24 26.5	22 34.6	+ 6 10.3	+0.1474	0.5778	0.1227	+52 -18			
$v^*$ Cancri	5.7	+2.89	- 6.4	+24 23.0	23 45.0	+ 7 18.0	+0.0621	0.5768	-0.1257	+47 -22			
$v^*$ Cancri	6.4	2.88	6.5	24 23.4	21 0 21.3	+ 7 53.0	-0.0207	0.5762	0.1272	+42 -27			
194 B. Cancri	6.3	2.65	8.6	23 20.4	14 42.2	- 2 18.4	-1.0111	0.5616	0.1598	-16 -67			
$\xi$ Cancri	5.2	2.63	8.4	22 24.5	15 31.4	- 1 30.9	-0.1784	0.5607	0.1615	+33 -39			
79 Cancri	6.1	2.63	8.4	22 21.6	15 56.8	- 1 6.5	-0.1976	0.5603	0.1623	+32 -40			
90 H' Cancri	6.1	+2.59	- 8.4	+21 39.1	17 21.8	+ 0 15.5	+0.3035	0.5588	-0.1652	+61 -14			
57 B. Leonis	6.5	2.36	9.6	19 16.5	22 7 1.8	-10 33.3	+0.3475	0.5449	0.1900	+64 -15			
$\eta$ Leonis	3.6	2.19	10.1	17 11.9	17 35.2	- 0 21.2	+0.4365	0.5348	0.2059	+70 -13			
42 Leonis	6.1	2.07	10.2	15 25.6	23 0 30.1	+ 6 20.4	+0.8538	0.5286	0.2148	+90 + 9			
46 Leonis	5.8	2.00	10.4	14 35.8	5 32.0	+11 12.7	+0.6398	0.5243	0.2206	+86 - 4			
$k$ Leonis	5.5	+1.91	-11.1	+14 40.0	12 34.1	- 5 58.3	-1.0140	0.5187	-0.2278	-13 -75			
$\omega$ Virginis	5.4	1.56	10.9	8 37.8	24 15 31.5	- 3 48.6	-0.9704	0.5018	0.2464	- 9 -81			
$v$ Virginis	4.2	1.50	10.8	7 1.8	19 29.6	+ 0 2.6	-0.2239	0.5000	0.2480	+31 -54			
$b$ Virginis	5.2	1.41	10.1	+ 4 9.2	25 3 7.4	+ 7 27.5	+0.9949	0.4969	0.2504	+90 +11			
$\gamma$ Virginis (mean)	2.9	1.16	9.5	- 0 57.5	26 2 10.0	+ 5 52.3	+0.7723	0.4915	0.2524	+89 - 3			
$k$ Virginis	5.7	+1.10	- 9.2	- 3 19.8	12 10.6	- 8 23.4	+0.8565	0.4909	-0.2509	+87 + 2			
46 Virginis	6.1	1.10	9.3	2 53.2	12 42.2	- 7 52.7	+0.2386	0.4909	0.2508	+56 -31			
48 Virginis	6.5	1.08	9.4	3 10.9	14 33.1	- 6 4.8	+0.0992	0.4909	0.2504	+48 -38			
$\theta$ Virginis	4.6	1.06	9.0	5 3.7	17 55.2	- 2 48.2	+1.3269	0.4910	0.2494	+85 +38			
65 Virginis	6.0	1.01	9.3	4 27.4	27 1 23.3	+ 4 27.7	-1.1929	0.4915	0.2467	-26 -90			
66 Virginis	5.7	+1.02	- 9.3	- 4 41.8	2 4.1	+ 5 7.4	-1.0959	0.4916	-0.2465	-18 -90			
72 Virginis	6.1	0.99	9.0	6 0.5	5 20.4	+ 8 18.5	-0.4523	0.4920	0.2450	+19 -70			
$l$ Virginis	4.8	0.98	9.1	5 47.6	6 12.3	+ 9 8.9	-0.9013	0.4922	0.2446	- 6 -90			
$m$ Virginis	5.4	0.94	8.6	8 15.1	11 32.8	- 9 39.3	+0.5149	0.4931	0.2418	+72 -16			
575 B. Virginis	6.2	0.93	8.5	9 15.7	14 38.5	- 6 38.7	+0.8860	0.4938	0.2401	+81 + 4			
96 Virginis	6.5	+0.87	- 8.5	- 9 54.7	28 2 37.2	+ 5 0.3	-1.2229	0.4971	-0.2319	-31 -90			
JUPITER				11 41.4	4 0.5	+ 6 21.3	+0.4289	0.4891	0.2278	+64 -21			
$\lambda$ Virginis	4.7	0.84	8.0	12 57.6	8 5.2	+10 19.1	+0.9025	0.4990	0.2274	+77 + 6			
8 Libræ	5.4	0.78	7.9	15 37.5	29 0 58.2	+ 2 43.5	+0.1592	0.5060	0.2108	+45 -34			
$\alpha^*$ Libræ	2.9	+0.78	- 7.9	-15 40.2	1 4.3	+ 2 49.4	+0.1877	0.5060	-0.2106	+47 -33			
NEW MOON.													

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
66 B. Sagittarii	4.7	+1.05	- 5.8	-27 4.6	d h m 8 4 22.4	+ 2 57.3	+0.0327	0.5512	-0.0246	+18	-41
68 G. Sagittarii	6.2	1.08	5.6	26 41.4	8 41.5	+ 7 7.4	-0.4776	0.5519	0.0140	- 9	-75
69 G. Sagittarii	6.3	1.08	5.6	26 48.8	8 51.4	+ 7 17.0	-0.3442	0.5519	0.0136	- 3	-65
86 B. Sagittarii	6.5	1.08	5.6	26 38.5	9 14.2	+ 7 38.9	-0.5390	0.5520	-0.0126	-13	-81
$\phi$ Sagittarii	3.3	1.15	5.2	27 5.1	16 38.7	- 9 12.1	-0.0743	0.5528	+0.0057	+11	-47
$\sigma$ Sagittarii	2.3	+1.17	- 4.9	-26 24.6	20 55.1	- 5 4.6	-0.7692	0.5529	+0.0164	-25	-90
$\tau$ Sagittarii	3.5	1.23	5.0	27 48.2	4 2 4.2	- 0 6.3	+0.8801	0.5529	0.0292	+62	+ 9
201 B. Sagittarii	5.9	1.24	4.3	26 3.6	4 53.2	+ 2 36.8	-0.9437	0.5528	0.0362	-34	-90
248 B. Sagittarii	5.7	1.32	4.0	27 10.3	12 15.1	+ 9 43.3	+0.6091	0.5520	0.0543	+55	- 8
$\omega$ Sagittarii	4.8	1.43	2.9	26 32.4	23 49.7	- 3 6.3	+0.7074	0.5500	0.0822	+63	- 2
A Sagittarii	4.9	+1.44	- 2.8	-26 26.4	5 1 13.9	- 1 44.9	+0.7167	0.5497	+0.0855	+63	- 2
40 B. Capricorni	6.2	1.57	1.4	25 14.9	16 32.9	-10 57.4	+0.9967	0.5454	0.1205	+65	+16
56 B. Capricorni	6.3	1.63	0.3	24 6.2	19 52.5	- 7 44.6	+0.1668	0.5443	0.1278	+35	-34
86 B. Capricorni	6.2	1.66	- 0.2	24 7.2	6 1 45.9	- 2 3.2	+0.9740	0.5423	0.1403	+66	+14
$\chi$ Capricorni	5.3	1.70	+ 1.1	21 33.3	8 58.4	+ 4 54.9	-0.7318	0.5397	0.1550	- 9	-90
$\phi$ Capricorni	5.3	+1.72	+ 1.6	-21 1.5	12 15.8	+ 8 5.7	-0.7813	0.5384	+0.1614	-11	-90
33 Capricorni	5.3	1.76	1.8	21 14.1	16 14.5	+11 56.5	+0.1013	0.5370	0.1690	+36	-37
35 Capricorni	6.0	1.78	1.9	21 35.2	17 41.1	-10 39.8	+0.7246	0.5365	0.1717	+68	- 3
128 B. Capricorni	6.5	1.77	2.7	19 32.4	18 59.6	- 9 23.9	-1.2455	0.5360	0.1741	-44	-90
37 Capricorni	5.7	1.80	2.7	20 29.1	21 16.2	- 7 11.7	+0.1701	0.5352	0.1782	+41	-34
e Capricorni	4.7	+1.81	+ 2.9	-19 52.1	22 19.5	- 6 10.5	-0.3015	0.5348	+0.1801	+17	-61
$\kappa$ Capricorni	4.8	1.84	3.3	19 16.6	7 0 57.5	- 3 37.6	-0.4555	0.5339	0.1848	+ 9	-72
143 B. Capricorni	6.1	1.85	3.1	20 1.9	1 13.4	- 3 22.2	+0.4019	0.5338	0.1852	+54	-22
154 B. Capricorni	6.1	1.88	3.7	19 2.5	5 14.9	+ 0 31.5	+0.1028	0.5324	0.1921	+39	-37
161 B. Capricorni	6.4	1.92	4.4	18 20.1	10 15.9	+ 5 22.7	+0.3327	0.5307	0.2003	+52	-25
29 Aquarii (mean)	6.5	+1.90	+ 4.8	-17 23.8	10 23.8	+ 5 30.4	-0.6400	0.5306	+0.2005	+ 2	-87
56 Aquarii	6.1	2.01	6.7	15 2.6	23 50.2	- 5 29.0	-0.3025	0.5267	0.2204	+21	-60
69 Aquarii	5.6	2.09	7.7	14 31.7	8 8 19.7	+ 2 44.4	+1.0708	0.5248	0.2314	+75	+17
$\tau$ Aquarii	4.4	2.09	7.9	14 3.9	9 15.1	+ 3 38.0	+0.7968	0.5245	0.2325	+76	0
74 Aquarii	5.8	2.09	8.8	12 5.6	11 9.7	+ 5 29.0	-0.8314	0.5242	0.2348	- 5	-90
290 B. Aquarii	6.3	+2.18	+ 9.8	-11 10.5	21 34.3	- 8 25.9	+0.7116	0.5228	+0.2460	+79	- 6
$\psi^1$ Aquarii	4.5	2.20	10.5	9 34.5	22 9.6	- 7 51.7	-0.8147	0.5227	0.2466	- 2	-90
$\psi^2$ Aquarii	4.6	2.19	10.5	9 40.3	23 10.1	- 6 53.1	-0.4654	0.5226	0.2476	+17	-71
$\psi^3$ Aquarii	5.2	2.20	10.4	10 6.0	23 41.2	- 6 22.9	+0.1108	0.5226	0.2481	+46	-37
336 B. Aquarii	6.3	2.24	10.8	9 45.5	9 4 38.6	- 1 34.8	+0.9941	0.5224	0.2526	+80	+11
351 B. Aquarii	6.5	+2.26	+11.7	- 7 57.6	7 51.5	+ 1 32.1	-0.0598	0.5223	+0.2553	+38	-46
376 B. Aquarii	6.3	2.32	12.4	6 52.6	14 16.0	+ 7 44.5	+0.4691	0.5226	0.2600	+69	-19
27 Piscium	5.1	2.34	13.7	4 3.1	19 15.2	-11 25.5	-1.1430	0.5230	0.2632	-22	-90
29 Piscium	5.1	2.36	14.0	3 31.5	20 47.8	- 9 55.9	-1.2779	0.5232	0.2641	-33	-90
4 Ceti	6.3	2.39	14.3	3 2.7	23 41.7	- 7 7.4	-1.0013	0.5237	0.2656	-12	-90
5 Ceti	6.3	+2.39	+14.4	- 2 56.7	23 55.5	- 6 54.0	-1.0443	0.5238	+0.2657	-14	-90
54 B. Ceti	6.3	2.47	14.7	2 42.8	10 7 52.9	+ 0 48.5	+0.8472	0.5255	0.2690	+87	+ 2
10 Ceti	6.4	2.48	15.6	0 32.6	8 54.6	+ 1 48.3	-1.0950	0.5258	0.2693	-18	-90
14 Ceti	5.4	2.53	15.5	- 0 59.7	13 14.0	+ 5 59.4	+0.5346	0.5271	0.2704	+76	-15
155 B. Piscium	6.5	2.59	17.0	+ 2 54.1	20 48.7	-10 40.4	-1.3744	0.5299	0.2714	-45	-87
77 Piscium	6.4	+2.67	+17.6	+ 4 26.1	11 3 42.7	- 3 59.8	-1.0492	0.5330	+0.2712	-14	-86
263 B. Piscium	6.4	2.79	18.6	7 30.0	14 15.0	+ 6 11.7	-1.2855	0.5389	0.2686	-34	-82
$\mu$ Piscium	5.0	2.82	18.0	5 41.1	15 5.4	+ 7 0.5	+0.7633	0.5395	0.2683	+90	- 2
$\sigma$ Piscium	4.4	2.89	18.9	8 42.6	22 3.0	-10 16.0	-0.4135	0.5440	0.2648	+22	-65
SATURN	.	.	.	9 2.5	12 4 47.9	- 3 44.8	+1.0263	0.5505	0.2606	+90	+16
29 Arietis	6.1	+3.18	+19.3	+14 38.5	18 59.3	+ 9 56.5	-0.9426	0.5605	+0.2458	- 9	-75
$\sigma$ Arietis	5.8	3.24	18.9	14 56.2	23 56.4	- 9 17.2	-0.0319	0.5649	0.2393	+41	-39
$\sigma$ Arietis	5.5	3.28	18.6	14 43.0	13 2 51.5	- 6 28.6	+0.8771	0.5675	0.2351	+90	+10
124 B. Arietis	6.4	3.30	18.8	16 7.3	3 33.1	- 5 48.5	-0.3477	0.5682	0.2341	+25	-55
145 B. Arietis	6.5	3.35	18.2	15 30.7	8 19.2	- 1 13.1	+1.3515	0.5725	0.2265	+90	+55
53 Arietis	6.0	+3.39	+18.6	+17 32.3	9 25.6	- 0 9.3	-0.3961	0.5736	+0.2246	+22	-57

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.													
DECEMBER.													
THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.			Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d	h	m	h	m				
54 Arietis	6.5	+3.41	+18.7	+18 27.3	13	9	47.5	+ 0 11.8	-1.2179	0.5740	+0.2240	-32	-72
175 B. Arietis	6.4	3.50	17.7	18 26.8	17	21.2	+ 7 28.1	+0.4335	0.5809	0.2099	+70	-12	
14 H' Tauri	6.5	3.59	17.4	20 37.7	22	4.1	+11 59.9	-0.7423	0.5853	0.2002	+ 2	-69	
13 Tauri	5.6	3.58	17.0	19 25.0	23	23.2	-10 44.2	+0.7083	0.5865	0.1973	+90	+ 5	
14 Tauri	6.2	3.60	16.9	19 23.1	23	57.5	-10 11.2	+0.8517	0.5870	0.1961	+90	+13	
22 H' Tauri	6.1	+3.62	+17.1	+20 39.0	14	0 12.8	- 9 56.5	-0.3392	0.5872	+0.1955	+25	-50	
133 B. Tauri	5.9	3.67	16.9	21 58.5	2	19.2	- 7 55.1	-1.2329	0.5891	0.1907	-36	-68	
32 Tauri	5.8	3.70	16.4	22 13.4	5	0.4	- 5 20.4	-0.9720	0.5915	0.1845	-13	-68	
41 Tauri	4.6	3.74	15.8	21 50.5	8	1.0	- 2 27.1	-0.0520	0.5941	0.1771	+40	-33	
39 Tauri	6.1	3.74	15.7	21 46.3	8	15.6	- 2 13.1	+0.0596	0.5943	0.1765	+46	-27	
192 B. Tauri	6.1	+3.76	+15.3	+22 11.2	11	7.3	+ 0 31.5	+0.1469	0.5967	+0.1693	+51	-21	
51 Tauri	5.6	3.77	14.8	21 21.8	13	13.3	+ 2 32.4	+1.3027	0.5984	0.1638	+90	+57	
56 Tauri	5.2	3.78	14.8	21 33.6	13	41.0	+ 2 58.9	+1.1852	0.5988	0.1625	+90	+42	
62 Tauri	6.1	3.85	14.7	24 5.8	15	17.8	+ 4 31.7	-1.0397	0.6001	0.1582	-19	-66	
6 Tauri	4.1	3.82	14.4	22 5.6	15	50.1	+ 5 2.6	+1.0076	0.6005	0.1567	+90	+28	
67 Tauri	5.4	+3.82	+14.4	+21 59.9	15	51.3	+ 5 3.8	+1.1026	0.6005	+0.1567	+90	+35	
1 Tauri	4.2	3.83	14.4	22 36.8	16	10.8	+ 5 22.5	+0.5505	0.6008	0.1558	+80	+ 1	
72 Tauri	5.4	3.83	14.3	22 47.9	16	32.9	+ 5 43.6	+0.4276	0.6011	0.1548	+70	- 6	
284 B. Tauri	6.0	3.88	13.5	23 9.7	19	57.8	+ 9 0.0	+0.5841	0.6036	0.1452	+84	+ 3	
7 Tauri	4.5	3.88	13.1	22 47.3	22	6.2	+11 2.9	+1.2531	0.6051	0.1390	+90	+52	
95 Tauri	6.2	+3.92	+13.1	+23 55.4	22	26.9	+11 22.8	+0.1905	0.6053	+0.1380	+54	-16	
300 B. Tauri	6.2	3.91	12.9	23 28.0	23	22.1	-11 44.4	+0.7622	0.6060	0.1353	+90	+14	
315 B. Tauri	6.3	3.97	12.0	24 27.1	15	3 13.4	- 8 3.0	+0.2967	0.6084	0.1237	+61	- 9	
99 Tauri	6.0	3.95	11.9	23 48.7	3	47.8	- 7 30.1	+0.9946	0.6088	0.1220	+90	+30	
6 Tauri	5.6	3.99	11.9	24 54.9	3	54.4	- 7 23.8	-0.0729	0.6088	0.1217	+39	-28	
103 Tauri	5.5	+3.99	+11.0	+24 9.0	7	32.2	- 3 55.4	+1.0984	0.6108	+0.1104	+90	+39	
118 Tauri	5.4	4.06	9.1	25 4.8	15	8.8	+ 3 21.4	+0.9341	0.6143	0.0858	+90	+29	
112 B. Aurigæ	5.7	4.13	8.3	26 52.3	17	56.2	+ 6 1.4	-0.5953	0.6152	0.0766	+ 9	-55	
125 Tauri	5.1	4.10	8.1	25 51.0	18	52.6	+ 6 55.4	+0.4774	0.6155	0.0734	+75	+ 5	
136 Tauri	4.6	4.17	6.7	27 35.6	23	41.7	+11 31.8	-0.9206	0.6165	0.0571	-12	-62	
139 Tauri	4.7	+4.12	+ 6.3	+25 56.7	16	1 22.9	-10 51.6	+0.7904	0.6168	+0.0513	-90	+23	
415 B. Tauri	6.1	4.18	6.0	27 34.2	2	25.7	- 9 51.5	-0.7546	0.6169	0.0478	- 1	-62	
49 Aurigæ	5.1	4.20	2.4	28 5.6	14	34.9	+ 1 45.5	-0.9478	0.6162	0.0058	-14	-62	
54 Aurigæ	5.8	4.21	1.9	28 20.6	16	7.8	+ 3 14.3	-1.1903	0.6158	+0.0005	-38	-62	
39 Geminorum	6.2	4.11	+ 0.2	26 12.0	23	3.6	+ 9 51.9	+0.8498	0.6135	-0.0232	+90	+29	
40 Geminorum	6.3	+4.11	0.0	+26 2.2	23	17.9	+10 5.5	+1.0056	0.6135	-0.0240	+90	+39	
47 Geminorum	5.6	4.13	- 1.4	27 0.3	17	3 35.2	- 9 48.3	-0.0864	0.6114	0.0384	+38	-22	
53 Geminorum	5.9	4.15	1.9	28 3.2	5	13.6	- 8 14.1	-1.1958	0.6105	0.0438	-39	-62	
134 B. Geminorum	6.5	4.12	2.0	26 51.1	5	38.6	- 7 50.3	-0.0206	0.6103	0.0452	+42	-19	
59 Geminorum	5.7	4.13	2.8	27 48.7	8	21.9	- 5 13.9	-1.1104	0.6087	0.0541	-28	-62	
v Geminorum	4.3	+4.08	- 4.0	+27 5.7	12	32.9	- 1 13.6	-0.6536	0.6059	-0.0675	+ 6	-59	
c Geminorum	5.5	4.02	4.6	25 59.9	15	35.8	+ 1 41.5	+0.2206	0.6037	0.0770	+56	- 9	
φ Geminorum	5.0	4.02	5.7	26 59.9	19	5.0	+ 5 1.8	-1.0670	0.6009	0.0877	-23	-63	
ω <sup>1</sup> Cancri	6.0	3.96	6.2	25 38.3	21	53.9	+ 7 43.7	+0.0343	0.5985	0.0961	+45	-21	
4 Cancri	6.2	3.94	6.2	25 20.2	22	12.4	+ 8 1.4	+0.3071	0.5982	0.0970	+62	- 7	
ψ Cancri	5.9	+3.92	- 7.5	+25 46.7	18	1 31.0	+11 11.8	-0.4742	0.5952	-0.1066	+16	-50	
λ Cancri	5.9	3.84	7.9	24 18.2	5	24.5	- 9 4.2	+0.5721	0.5916	0.1174	+83	+ 5	
28 Cancri	6.1	3.82	8.7	24 26.5	8	32.7	- 6 3.5	+0.0525	0.5886	0.1259	+46	-22	
11 <sup>1</sup> Cancri	5.7	3.80	9.0	24 23.0	9	40.9	- 4 58.1	-0.0326	0.5874	0.1289	+41	-27	
1 <sup>2</sup> Cancri	6.4	3.79	9.1	24 23.3	10	16.0	- 4 24.3	-0.1148	0.5868	0.1304	+36	-32	
194 B. Cancri	6.3	+3.59	-12.0	+23 20.4	19	0 8.9	+ 8 56.3	-1.1035	0.5721	-0.1635	-24	-67	
ε Cancri	5.2	3.57	11.9	22 24.4	0	56.5	+ 9 42.2	-0.2842	0.5713	0.1653	+27	-44	
79 Cancri	6.1	3.56	12.0	22 21.5	1	21.1	+10 5.8	-0.3036	0.5708	0.1661	+26	-46	
90 H' Cancri	6.1	3.53	12.1	21 39.1	2	43.3	+11 24.9	+0.1884	0.5693	0.1690	+54	-20	
57 B. Leonis	6.5	3.31	14.0	19 16.4	15	56.5	+ 0 9.2	+0.2202	0.5549	0.1941	+56	-22	
η Leonis	3.6	+3.14	-14.9	+17 11.9	20	2 9.6	+10 1.1	+0.2997	0.5441	-0.2100	+60	-20	

## ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1910.0.		Apparent Declina- tion.	Washington Mean Time.	Hour Angle, <i>H</i> .	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
		$\Delta\alpha$	$\Delta\delta$								
		<i>s</i>	<i>"</i>	<i>°</i>	<i>d h m</i>	<i>h m</i>				<i>°</i>	<i>°</i>
42 Leonis	6.1	+3.02	-15.4	+15 25.5	20 8 51.7	- 7 30.3	+0.7062	0.5374	-0.2189	+90	0
46 <i>k</i> Leonis	5.8	2.95	15.7	14 35.7	13 44.5	- 2 47.0	+0.4922	0.5327	0.2246	+74	-12
<i>w</i> Virginis	5.5	2.85	16.6	14 39.9	20 34.5	+ 3 49.8	-1.1422	0.5265	0.2316	-23	-75
<i>v</i> Virginis	5.4	2.47	16.9	8 37.7	21 22 51.5	+ 5 19.0	-1.1122	0.5070	0.2490	-19	-81
<i>b</i> Virginis	4.2	2.42	16.8	7 1.7	22 2 44.6	+ 9 5.3	-0.3752	0.5048	0.2504	+24	-63
10 Virginis	5.2	+2.31	-16.1	+ 4 9.1	10 13.6	- 7 38.6	+0.8300	0.5010	-0.2524	+90	+ 1
$\gamma$ Virginis ( <i>mean</i> )	6.2	2.25	15.9	+ 2 23.9	15 27.3	- 2 33.8	+1.3986	0.4988	0.2533	+90	+50
38 Virginis	2.9	2.02	15.3	- 0 57.6	23 8 55.6	- 9 34.6	+0.6140	0.4935	0.2532	+82	-11
<i>k</i> Virginis	6.1	1.98	14.8	3 4.1	15 15.8	- 3 24.9	+1.3117	0.4925	0.2521	+87	+36
46 Virginis	5.7	1.96	14.8	3 19.8	18 49.9	+ 0 3.3	+0.7020	0.4921	0.2511	+87	- 7
48 Virginis	6.1	+1.95	-14.9	- 2 53.3	19 21.2	+ 0 33.8	+0.0883	0.4921	-0.2510	+48	-38
$\theta$ Virginis	6.5	1.94	14.9	3 11.0	21 11.2	+ 2 20.8	-0.0496	0.4919	0.2504	+40	-46
65 Virginis	4.6	1.90	14.4	5 3.8	24 0 31.6	+ 5 35.8	+1.1726	0.4918	0.2493	+85	+23
66 Virginis	6.0	1.84	14.7	4 27.5	7 56.8	-11 11.2	-1.3293	0.4918	0.2463	-40	-90
72 Virginis	5.7	1.85	14.6	4 41.9	8 37.3	-10 31.8	-1.2325	0.4919	0.2460	-29	-90
<i>l</i> Virginis	6.1	+1.81	-14.2	- 6 0.6	11 52.5	- 7 21.9	-0.5902	0.4922	-0.2444	+13	-80
<i>m</i> Virginis	4.8	1.80	14.3	5 47.7	12 44.2	- 6 31.6	-1.0366	0.4922	0.2440	-15	-90
575 B. Virginis	5.4	1.75	13.5	8 15.2	18 3.3	- 1 21.2	+0.3769	0.4929	0.2410	+63	-23
96 Virginis	6.2	1.74	13.2	9 15.7	21 8.3	+ 1 38.7	+0.7491	0.4934	0.2391	+81	- 4
$\lambda$ Virginis	6.5	1.65	13.0	9 54.7	25 9 5.2	-10 44.2	-1.3427	0.4962	0.2306	-45	-90
JUPITER	4.7	+1.61	-12.1	-12 57.6	14 32.8	- 5 25.8	+0.7817	0.4979	-0.2260	+77	- 1
8 Libræ				13 20.0	21 12.3	+ 1 2.5	-0.2908	0.4933	0.2176	+23	-60
$\alpha^2$ Libræ	5.4	1.51	11.3	15 37.6	26 7 25.7	+10 58.5	+0.0582	0.5047	0.2091	+40	-40
<i>\nu</i> Libræ	2.9	1.51	11.3	15 40.3	7 31.7	+11 4.3	+0.0868	0.5047	0.2090	+41	-38
22 Libræ	5.3	1.47	11.0	15 54.7	15 46.9	- 4 54.8	-1.3325	0.5086	0.1992	-51	-90
26 Libræ	6.5	+1.47	-10.9	-16 8.4	15 52.7	- 4 49.2	-1.0989	0.5087	-0.1991	-26	-90
28 Libræ	6.3	1.45	10.5	17 26.1	19 52.4	- 0 56.5	-0.4448	0.5107	0.1940	+12	-71
147 B. Libræ	6.2	1.44	10.4	17 50.1	23 7.6	+ 2 12.9	-0.6254	0.5125	0.1896	+ 2	-86
150 B. Libræ	6.2	1.43	9.6	20 25.3	27 4 2.6	+ 6 59.1	+1.3325	0.5151	0.1827	+70	+52
11 H. Libræ	6.1	1.42	9.8	19 51.6	4 37.4	+ 7 32.8	+0.6027	0.5155	0.1819	+66	-10
172 B. Libræ	5.4	+1.42	- 9.9	-19 22.0	5 4.8	+ 7 59.3	-0.0279	0.5157	-0.1812	+31	-45
41 Libræ	5.9	1.41	9.4	20 43.3	7 54.8	+10 44.2	+0.9694	0.5173	0.1770	+69	+12
$\kappa$ Libræ	5.3	1.41	9.9	19 0.5	8 15.8	+11 4.6	-0.9952	0.5175	0.1764	-22	-90
$\lambda$ Libræ	5.0	1.40	9.8	19 23.4	9 47.4	-11 26.6	-0.8390	0.5184	0.1741	-12	-90
10 G. Scorpii	4.9	1.38	9.5	19 54.1	15 27.8	- 5 56.6	-1.2336	0.5216	0.1651	-44	-90
$\delta$ Scorpii	5.9	+1.38	- 9.2	-20 43.5	17 35.9	- 3 52.4	-0.6675	0.5229	-0.1616	- 4	-90
19 Scorpii	2.6	1.38	8.8	22 22.1	18 52.8	- 2 37.9	+0.9521	0.5236	0.1595	+68	+12
<i>\rho</i> Ophiuchi	4.9	1.36	8.2	23 57.3	28 4 44.7	+ 6 55.4	+1.2245	0.5294	0.1421	+66	+38
126 B. Scorpii	4.7	1.35	8.2	23 14.5	7 8.2	+ 9 14.3	+0.0984	0.5308	0.1376	+33	-37
	6.1	+1.34	- 7.8	-24 17.8	14 45.0	- 7 23.7	+0.2755	0.5351	-0.1229	+41	-28

NEW MOON.

NEW MOON.

## OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1910.

Date.			THE STAR'S		IMMERSION.						EMERSION.						Duration of Oc- cultation.
					Washington.		Angle from—		Washington.		Angle from—						
Name.		Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	h	m					
Jan.	3	ι Virginis	4.8	9 47	14 55	184	228	10 23	15 30	243	283	0	35				
	5	ν Libræ	5.3	12 48	17 48	112	141	14 10	19 9	317	329	1	21				
	5	22 Libræ	6.5	13 19	18 18	150	173	14 35	19 34	278	285	1	16				
	6	λ Libræ	4.9	11 54	16 50	145	188	12 58	17 53	272	306	1	3				
	14	τ Aquarii	4.4	0 18	4 44	55	33	1 30	5 56	237	202	1	12				
	20	53 Tauri	5.3	6 29	10 31	76	24	7 44	11 45	256	199	1	14				
	20	247 B. Tauri	5.8	10 44	14 45	47	355	11 27	15 28	299	250	0	43				
	23	Α Geminorum	5.1	8 2	11 51	139	106	9 6	12 55	240	187	1	4				
	26	η Leonis	3.6	5 51	9 29	93	148	7 3	10 41	305	357	1	12				
	26	42 Leonis	6.1	15 43	19 20	73	20	16 25	20 1	338	286	0	41				
	28	ν Virginis	4.2	8 36	12 6	113	159	9 56	13 26	313	346	1	20				
Feb.	12	54 B. Ceti †	6.3	5 56	8 27	40	348	6 45	9 16	266	215	0	49				
	15	145 B. Arietis	6.5	6 23	8 43	22	330	7 12	9 31	295	241	0	48				
	19	40 Geminorum	6.3	6 4	8 7	34	71	6 52	8 55	327	329	0	48				
	19	52 Geminorum	6.1	13 56	15 58	147	97	14 31	16 33	234	186	0	35				
	23	46 Leonis	5.8	3 46	5 34	141	191	4 33	6 21	251	304	0	47				
	26	46 Virginis	6.1	14 2	15 36	195	176	14 37	16 12	243	216	0	36				
	26	48 Virginis	6.5	15 56	17 31	120	80	17 10	18 45	304	257	1	14				
Mar.	1	26 Libræ	6.3	13 43	15 6	162	181	14 51	16 14	266	270	1	8				
	1	28 Libræ	6.2	18 22	19 44	62	25	19 15	20 37	336	292	0	53				
	2	10 G. Scorpii †	5.9	10 50	12 10	189	238	11 8	12 28	223	270	0	18				
	3	26 Ophiuchi	5.8	18 9	19 23	161	145	18 55	20 10	223	198	0	47				
	5	φ Sagittarii	3.3	14 24	15 31	145	189	15 13	16 20	235	273	0	49				
	16	τ Tauri	4.5	7 0	7 26	77	23	8 15	8 40	262	204	1	14				
	18	37 Geminorum	5.7	13 10	13 27	146	93	13 47	14 3	233	183	0	36				
	22	46 Leonis	5.8	14 29	14 30	64	11	15 6	15 6	355	302	0	36				
	29	41 Libræ *	5.3	9 40	9 13	68	121	10 19	9 53	345	35	0	40				
	29	κ Libræ	5.0	11 20	10 53	72	117	12 7	11 41	348	27	0	48				
	31	136 G. Ophiuchi	6.3	13 41	13 6	140	180	14 46	14 11	260	291	1	5				
	31	151 G. Ophiuchi	6.0	16 44	16 8	132	141	18 5	17 29	255	247	1	21				
Apr.	12	51 Tauri	5.6	8 1	6 40	115	58	8 53	7 32	223	167	0	52				
	12	56 Tauri	5.2	8 33	7 12	84	27	9 34	8 13	257	201	1	1				
	12	67 Tauri †	5.4	11 9	9 47	28	338	11 38	10 16	317	270	0	29				
	16	λ Cancræ	5.9	6 8	4 31	105	160	7 34	5 57	276	307	1	26				
	18	η Leonis	3.6	7 9	5 25	146	197	8 20	6 35	261	303	1	10				
	18	42 Leonis †	6.1	16 43	14 57	104	53	17 35	15 49	304	257	0	52				
	24	8 Libræ *	5.4	19 57	17 46	146	96	20 48	18 37	249	197	0	51				
	24	α* Libræ	2.9	20 8	17 58	155	105	20 51	18 41	240	187	0	43				
	25	11 H. Libræ	5.4	16 26	14 13	130	116	17 53	15 39	280	250	1	26				
	26	ρ Ophiuchi	4.7	19 10	16 52	128	94	20 22	18 4	255	211	1	12				
May	30	Α Sagittarii	4.9	16 21	13 48	144	183	17 5	14 32	213	246	0	44				
	3	69 Aquarii	5.6	19 18	16 32	21	61	20 10	17 24	289	321	0	52				
	19	46 Virginis	6.1	14 20	10 33	167	144	15 27	11 39	270	234	1	6				
	19	48 Virginis	6.5	16 31	12 43	105	61	17 40	13 52	316	267	1	9				
	22	26 Libræ	6.3	14 15	10 15	83	96	15 24	11 24	342	338	1	9				
	23	10 G. Scorpii †	5.9	10 53	6 50	92	141	11 52	7 49	323	7	0	59				
	24	88 B. Ophiuchi	6.3	18 38	14 29	93	71	20 3	15 54	285	249	1	25				
	24	26 Ophiuchi	5.8	18 49	14 41	66	42	20 0	15 52	312	276	1	11				
June	12	46 Leonis	5.8	15 34	10 12	88	34	16 24	11 2	327	275	0	50				
	20	126 B. Scorpii	6.1	19 3	13 9	165	136	19 39	13 45	217	181	0	36				
	21	136 G. Ophiuchi	6.3	13 20	7 23	115	159	14 33	8 35	284	318	1	12				
	21	151 G. Ophiuchi	6.0	16 17	10 19	106	121	17 47	11 49	282	278	1	30				
	23	248 B. Sagittarii	5.7	20 36	14 30	154	139	20 55	14 49	180	161	0	19				

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb, toward the east.

\* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.



## OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1910.

Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Oc- cultation.		
			Washington.		Angle from—		Washington.		Angle from—				
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.			
June July	25	35	Capricorni	6.0	h m 0 16	h m 18 1	° 134	° 99	h m 0 37	h m 18 22	° 170	° 132	h m 0 21
	3	247	B. Tauri	5.8	21 9	14 23	120	168	21 41	14 55	201	251	0 32
	16	11	H. Libræ	5.4	18 49	11 12	83	44	19 58	12 22	310	263	1 10
	23	161	B. Capricorni	6.4	23 58	15 53	34	8	1 4	16 59	262	226	1 6
	24	69	Aquarii	5.6	18 43	10 35	81	125	19 52	11 44	229	264	1 9
	24	r	Aquarii	4.4	20 12	12 4	32	64	21 20	13 11	270	290	1 7
	25	376	B. Aquarii	6.3	1 59	17 46	18	346	2 57	18 44	269	228	0 58
	27	μ	Piscium	5.0	2 3	17 42	21	8	3 8	18 47	265	233	1 5
	31	103	Tauri	5.5	22 13	13 37	7	57	22 32	13 56	320	12	0 19
	Aug. 10	m	Virginis	5.4	17 50	8 35	89	43	18 50	9 36	322	272	1 1
	15	4	G. Sagittarii	6.2	20 32	10 57	111	78	21 42	12 8	245	202	1 11
	18	56	B. Capricorni	6.3	22 1	12 14	351	332	22 20	12 33	324	302	0 19
	19	35	Capricorni †	6.0	15 55	6 5	97	149	16 56	7 6	240	286	1 1
	19	143	B. Capricorni	6.1	1 33	15 42	102	59	2 20	16 28	202	155	0 46
	27	99	Tauri	6.0	1 30	15 7	111	170	2 22	15 59	206	262	0 52
	28	139	Tauri	4.7	0 53	14 27	65	124	1 54	15 28	265	326	1 1
	29	39	Geminorum	6.2	0 31	14 0	85	138	1 27	14 56	261	318	0 56
	29	40	Geminorum	6.3	0 52	14 22	129	183	1 32	15 2	218	274	0 40
	Sept. 23	284	B. Tauri	6.0	0 34	12 25	49	107	1 36	13 27	264	321	1 2
	23	95	Tauri	6.2	4 28	16 18	26	33	5 25	17 15	297	265	0 57
Oct.	24	125	Tauri	5.1	1 11	12 58	47	107	2 9	13 56	279	339	0 58
	29	46	Leonis	5.8	4 52	16 19	168	221	5 25	16 52	230	284	0 33
	13	143	B. Capricorni	6.1	0 26	10 59	26	352	1 24	11 56	273	231	0 57
	15	336	B. Aquarii	6.3	0 3	10 28	122	112	0 28	10 53	162	145	0 25
	19	175	B. Arietis †	6.4	9 40	19 47	85	33	10 31	20 38	248	200	0 51
	20	v	Tauri	4.2	8 54	18 58	144	87	9 22	19 26	199	143	0 28
	20	72	Tauri	5.4	9 8	19 12	103	46	10 3	20 7	242	187	0 55
	24	λ	Cancrī †	5.9	0 18	10 7	114	157	1 4	10 54	252	300	0 47
	24	28	Cancrī	6.1	3 33	13 22	59	117	4 27	14 16	311	10	0 54
	24	v <sup>2</sup>	Cancrī	5.7	5 0	14 49	58	117	5 58	15 47	320	17	0 58
	24	v <sup>2</sup>	Cancrī	6.4	6 0	15 49	37	94	6 35	16 23	347	39	0 34
	Nov. 7	248	B. Sagittarii	5.7	22 8	7 3	31	0	23 5	7 59	296	255	0 56
	15	0	Arietis	5.8	5 43	14 5	339	289	5 50	14 12	328	277	0 7
	17	284	B. Tauri	6.0	22 35	6 50	39	93	23 20	7 36	279	335	0 46
	17	95	Tauri	6.2	1 44	9 59	4	62	2 14	10 29	309	5	0 30
	17	315	B. Tauri	6.3	7 57	16 11	95	36	9 2	17 16	252	193	1 5
	18	125	Tauri	5.1	22 4	6 16	1	47	22 15	6 27	333	20	0 11
	20	4	Cancrī	6.2	2 4	10 7	92	147	3 3	11 6	269	327	0 59
	20	λ	Cancrī	5.9	12 7	20 8	132	73	13 5	21 6	270	212	0 58
	21	90	H <sup>2</sup> . Cancrī	6.1	8 50	16 48	113	125	10 13	18 11	299	263	1 23
	22	η	Leonis	3.6	8 58	16 52	141	172	10 17	18 11	280	273	1 19
	Dec. 9	336	B. Aquarii	6.3	20 14	3 3	65	105	21 30	4 19	229	257	1 16
	10	54	B. Ceti	6.3	0 55	7 39	117	107	1 25	8 10	164	146	0 31
	12		SATURN		20 16	2 54	74	126	21 11	3 48	226	278	0 54
	14	192	B. Tauri	6.1	4 24	10 52	49	38	5 37	12 5	268	224	1 13
	14	v	Tauri	4.2	10 36	17 3	109	56	11 22	17 49	237	188	0 46
	14	72	Tauri †	5.4	10 57	17 24	77	26	11 46	18 13	270	223	0 49
	17	c	Geminorum	5.5	9 30	15 46	80	24	10 34	16 50	313	253	1 4
	19	57	B. Leonis	6.5	9 8	15 15	95	113	10 22	16 29	324	301	1 14
	20	46	Leonis	5.8	6 23	12 27	179	232	6 50	12 55	226	278	0 28
	23	k	Virginis	5.7	12 20	18 12	135	145	13 46	19 37	307	293	1 25
	24	m	Virginis	5.4	10 35	16 23	108	147	11 49	17 37	330	356	1 14

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb, toward the east.

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

## FOR WASHINGTON MEAN NOON.

Date.	$k$	$i$	$\theta$	$L$	Date.	$k$	$i$	$\theta$	$L$
Jan. 0	0.849	46	356	45.4	July 4	0.746	61	175	59.6
5	0.741	61	351	55.7	9	0.879	41	183	66.6
10	0.573	82	347	63.6	14	0.970	20	197	67.3
15	0.345	108	342	56.6	19	0.998	5	283	60.8
20	0.119	140	334	26.2	24	0.976	18	357	51.4
25	0.009	169	280	2.2	29	0.928	31	9	43.2
30	0.067	150	188	13.8	Aug. 3	0.872	42	15	37.2
Feb. 4	0.214	125	178	32.3	8	0.815	51	19	33.3
9	0.365	106	174	39.0	13	0.760	59	22	31.2
14	0.489	91	170	38.1	18	0.703	66	24	30.3
19	0.586	80	167	35.2	23	0.644	73	26	30.6
24	0.661	71	163	32.3	28	0.576	81	27	31.5
Mar. 1	0.723	64	160	30.3	Sept. 2	0.496	90	29	32.8
6	0.774	57	157	29.3	7	0.400	102	31	33.6
11	0.821	50	154	29.3	12	0.283	116	33	31.4
16	0.864	43	151	30.6	17	0.153	134	37	22.7
21	0.907	36	148	33.4	22	0.039	157	49	7.4
26	0.947	27	145	38.0	27	0.009	169	165	1.8
31	0.982	16	140	45.0	Oct. 2	0.115	140	201	23.4
Apr. 5	0.999	3	82	54.4	7	0.331	110	206	53.6
10	0.979	17	340	64.3	12	0.570	82	209	66.5
15	0.897	37	336	69.8	17	0.757	59	210	61.7
20	0.758	59	337	67.1	22	0.876	41	211	50.8
25	0.592	79	339	57.9	27	0.944	28	210	41.1
30	0.431	98	341	46.4	Nov. 1	0.979	17	209	33.9
May 5	0.291	115	342	35.0	6	0.995	8	208	29.2
10	0.174	131	344	23.6	11	1.000	1	198	26.3
15	0.082	147	346	12.5	16	0.998	5	26	24.8
20	0.021	163	352	3.5	21	0.990	11	22	24.4
25	0.001	176	79	0.2	26	0.977	17	19	25.1
30	0.024	162	147	3.8	Dec. 1	0.958	24	15	27.1
June 4	0.081	147	153	11.9	6	0.927	31	11	30.4
9	0.161	133	156	20.6	11	0.882	40	6	35.7
14	0.254	119	158	28.3	16	0.811	51	2	43.2
19	0.358	107	161	35.2	21	0.702	66	357	52.6
24	0.475	93	165	42.4	26	0.535	86	353	59.8
29	0.605	78	170	50.6	31	0.311	112	349	52.4

## NOTATION.

$k$ =the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

$i$ =the angle between the Sun and Earth, as seen from the planet.

$\theta$ =the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

$L$ =the brilliancy of the disk. The unit of  $L$  is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

## FOR WASHINGTON MEAN NOON.

Date.	$k$	$i$	$\theta$	$L$	Date.	$k$	$i$	$\theta$	$L$
Jan. 1	0.313	111.9	340.9	215.7	July 5	0.784	55.3	168.0	71.1
6	0.273	117.0	339.3	219.8	10	0.800	53.2	170.4	69.0
11	0.230	122.6	337.6	217.3	15	0.814	51.1	173.0	66.9
16	0.185	129.1	335.6	205.1	20	0.828	49.0	175.7	65.2
21	0.139	136.3	332.8	179.8	25	0.841	47.0	178.5	63.4
26	0.094	144.3	328.7	140.5	30	0.854	45.0	181.5	61.9
31	0.054	153.1	321.6	91.4	Aug. 4	0.866	42.9	184.5	60.6
Feb. 5	0.026	161.4	308.7	45.7	9	0.878	40.8	187.5	59.3
10	0.011	168.2	271.1	20.6	14	0.890	38.8	190.3	58.1
15	0.014	166.3	220.2	26.9	19	0.901	36.8	193.0	57.1
20	0.035	158.5	195.2	61.1	24	0.910	34.8	195.5	56.1
25	0.068	149.7	184.4	107.4	29	0.920	32.8	198.0	55.1
Mar. 2	0.110	141.3	181.4	149.9	Sept. 3	0.929	30.9	200.3	54.3
7	0.155	133.6	174.5	180.4	8	0.938	28.9	202.4	53.5
12	0.200	126.8	171.5	197.7	13	0.946	26.9	204.4	52.8
17	0.244	120.8	169.0	204.2	18	0.952	25.0	206.0	52.1
22	0.286	115.4	166.8	203.0	23	0.959	23.1	207.3	51.6
27	0.325	110.6	164.8	194.7	28	0.965	21.1	208.4	51.0
Apr. 1	0.361	106.2	163.0	188.2	Oct. 3	0.971	19.2	209.4	50.5
6	0.395	102.2	161.7	178.2	8	0.977	17.4	210.2	50.0
11	0.426	98.5	159.9	167.8	13	0.982	15.6	210.6	49.5
16	0.457	95.0	158.6	157.8	18	0.986	13.8	210.8	49.1
21	0.485	91.8	157.5	148.2	23	0.989	11.9	210.9	48.8
26	0.511	88.7	156.6	139.1	28	0.992	10.1	210.7	48.4
May 1	0.536	85.8	155.9	130.8	Nov. 2	0.994	8.4	210.4	48.1
6	0.560	83.1	155.5	123.1	7	0.996	6.6	210.1	48.0
11	0.583	80.6	155.3	115.7	12	0.998	4.8	210.1	47.8
16	0.605	78.0	155.2	109.8	17	0.999	3.1	211.0	47.6
21	0.626	75.4	155.4	104.0	22	1.000	1.4	218.5	47.5
26	0.647	73.0	155.9	98.8	27	1.000	0.1	326.7	47.4
31	0.667	70.6	156.6	94.1	Dec. 2	1.000	1.9	354.6	47.3
June 5	0.685	68.3	157.5	89.9	7	0.999	3.7	8.2	47.3
10	0.703	66.1	158.7	85.9	12	0.998	5.3	11.8	47.4
15	0.720	63.9	160.0	82.4	17	0.997	7.0	5.8	47.4
20	0.737	61.7	161.7	79.1	22	0.994	8.6	3.6	47.5
25	0.754	59.5	163.7	76.2	27	0.991	10.2	1.2	47.7
30	0.770	57.4	165.7	73.6	32	0.987	11.9	358.7	48.1

## NOTATION.

$k$  = the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

$i$  = the angle between the Sun and Earth, as seen from the planet.

$\theta$  = the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

$L$  = the brilliancy of the disk. The unit of  $L$  is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

MARS not being in opposition during the year 1910 the satellites will not be visible.

APPARENT DISK OF MARS, 1910.

		$k$
January	1,	0.878
January	31,	0.885
March	2,	0.901
April	1,	0.921
May	1,	0.941
May	31,	0.960
June	30,	0.976
July	30,	0.990
August	29,	0.998
September	28,	1.000
October	28,	0.997
November	27,	0.988
December	27,	0.974

$k$  = the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

The ephemeris of the four outer satellites of Jupiter is given on pages 486-507, each month occupying two pages, which contain, respectively, the times of the phenomena and the diagrams of the configurations. The latter are given for each day, Jupiter being represented by a light disk, ○, in the center of the page, and the relative positions of the satellites at the Washington time stated above the diagrams being indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot, according as the motion of the satellite at the instant in question is toward the east or toward the west, the motion being always toward the numeral. In constructing the diagrams the latitudes of the satellites are always considered zero, except where two or more of them chance to be at nearly the same distance from the planet, when they are placed one above the other, according to their apparent latitudes. If, at the epoch of any configuration, one or more satellites are projected on the disk of the planet, that phenomenon is indicated by a light disk, ○, at the left-hand side of the page; and if any satellites are invisible on account of being occulted behind the disk of the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, ●, at the right-hand side of the page. In both cases the annexed numerals serve to point out which satellites are thus rendered invisible.

At any time near opposition, March 31, 1910, the approximate distances from Jupiter of the four outer satellites may be obtained by means of the following tables, using the interval of time before or after superior geocentric conjunction as argument. The position angle of the semi-axes minor of the orbits is + 25°.

The differential coordinates of the sixth satellite will be found on page 512.

SATELLITES OF JUPITER

Satellite I.		Satellite II.		Satellite III.		Satellite IV.	
Arg.	s.	Arg.	s.	Arg.	s.	Arg.	s.
h	"	d h	"	d h	"	d	"
2	39	0 4	60	0 8	95	1	214
4	74	0 8	115	0 16	183	2	398
6	103	0 12	161	1 0	255	3	526
8	123	0 16	192	1 8	305	4	581
10	132	0 20	207	1 16	329	5	556
12	130	1 0	204	2 0	326	6	453
14	116	1 4	183	2 8	295	7	288
16	93	1 8	147	2 16	239	8	82
18	61	1 12	98	3 0	162	.	...
20	25	1 16	40	3 8	72	.	...

MEAN SYNODIC PERIODS OF THE SATELLITES.

I.	d h m s	=	d	III.	d h m s	=	d
II.	1 18 28 35.945	=	1.769 860 48	IV.	7 3 59 35.854	=	7.166 387 20
	3 13 17 53.735	=	3.554 094 16		16 18 5 6.928	=	16.753 552 41
V.	d h m s	=	d				
	0 11 57 27.635	=	0.498 236 52				
VI.		=	d				
		=	266.00				

## SATELLITE V.

WASHINGTON MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

Jan.	d	h	E.	Apr.	d	h	E.	Jan.	d	h	W.	Apr.	d	h	W.
	10	6.2	E.		10	10.0	E.		10	12.2	W.		10	16.0	W.
	20	17.3	E.		20	9.1	E.		20	11.4	W.		20	15.1	W.
	30	16.4	E.		30	8.2	E.		30	10.5	W.		30	14.2	W.
Feb.	9	15.5	E.	May	10	7.4	E.	Feb.	9	9.6	W.	May	10	13.3	W.
	19	14.6	E.		20	18.4	E.		19	8.6	W.		20	12.5	W.
Mar.	1	13.7	E.		30	17.6	E.	Mar.	1	7.7	W.		30	11.6	W.
	11	12.8	E.	June	9	16.7	E.		11	6.8	W.	June	9	10.7	W.
	21	11.9	E.		19	15.9	E.		21	17.9	W.		19	9.9	W.
	31	11.0	E.		29	15.0	E.		31	16.9	W.		29	9.1	W.

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

## SATELLITE I.

Jan.		h	m	Mar.	20	h	m	June	5	h	m	Aug.	22	h	m
	1				21	22	15.5		7	17	47.4		24	15	13.2
	3	2	33.3		23	16	41.3		9	12	15.5		26	9	43.3
	4	21	1.5		25	11	7.2		11	6	43.6		28	4	13.5
	6	15	29.6		27	5	33.0		13	1	11.8		29	22	43.6
	8	9	57.7		28	23	58.9		14	19	40.0		31	17	13.8
	10	4	25.7		30	18	24.8		16	14	8.3	Sept.	2	11	44.0
	11	22	53.7		1	12	50.7		18	8	36.7		4	6	14.2
	13	17	21.6	Apr.	3	7	16.6		20	3	5.2		6	0	44.4
	15	11	49.4		5	1	42.5		21	21	33.7		7	19	14.6
	17	6	17.2		6	20	8.4		23	16	2.2		9	13	44.9
	19	0	44.9		8	14	34.4		25	10	30.8		11	8	15.2
	20	19	12.5		10	9	0.3		27	4	59.5		13	2	45.5
	22	13	40.0		12	3	26.3		28	23	28.3		14	21	15.8
	24	8	7.5		13	21	52.3		30	17	57.1		16	15	46.1
	26	2	34.9		15	16	18.4	July	2	12	26.0				
	27	21	2.3		17	10	44.5		4	6	54.9				
	29	15	29.6		19	5	10.6		6	1	23.9				
	31	9	56.8		20	23	36.8		7	19	52.9	Nov.	17	15	27.2
Feb.	2	4	23.9		22	18	3.0		9	14	22.0		19	9	57.4
	3	22	51.0		24	12	29.3		11	8	51.1		21	4	27.5
	5	17	18.0		26	6	55.7		13	3	20.3		22	22	57.6
	7	11	45.0		28	1	22.1		14	21	49.5		24	17	27.7
	9	6	11.9		29	19	48.5		16	16	18.8		26	11	57.7
	11	0	38.7	May	1	14	15.0		18	10	48.2		28	6	27.7
	12	19	5.5		3	8	41.6		20	5	17.6		30	0	57.7
	14	13	32.2		5	3	8.2		21	23	47.0	Dec	1	19	27.7
	16	7	58.8		6	21	34.9		23	18	16.5		3	13	57.6
	18	2	25.3		8	16	1.7		25	12	46.0		5	8	27.5
	19	20	51.8		10	10	28.5		27	7	15.6		7	2	57.4
	21	15	18.3		12	4	55.4		29	1	45.2		8	21	27.3
	23	9	44.7		13	23	22.4	Aug.	30	20	14.8		10	15	57.1
	25	4	11.0		15	17	49.4		1	14	44.5		12	10	26.8
	26	22	37.3		17	12	16.5		3	9	14.2		14	4	56.6
	28	17	3.5		19	6	43.7		5	3	43.9		15	23	26.3
Mar.	2	11	29.7		21	1	11.0		6	22	13.7		17	17	55.9
	4	5	55.8		22	19	38.3		8	16	43.5		19	12	25.6
	6	0	21.9		24	14	5.7		10	11	13.4		21	6	55.1
	7	18	48.0		26	8	33.2		12	5	43.3		23	1	24.7
	9	13	14.1		28	3	0.7		14	0	13.2		24	19	54.2
	11	7	40.1		29	21	28.3		15	18	43.1		26	14	23.7
	13	2	6.1		31	15	56.0		17	13	13.1		28	8	53.1
	14	20	32.0	June	2	10	23.7		19	7	43.1		30	3	22.5
	16	14	57.9		4	4	51.5		21	2	13.1		31	21	51.9
	18	9	23.8												

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

		h	m			h	m			h	m			h	m
Jan.	2	21	35.9	Mar.	25	13	12.5	June	15	4	28.3	Sept.	4	23	20.9
	6	10	53.0		29	2	20.9		18	17	44.8		8	12	44.0
	10	0	10.5		1	15	28.1		22	7	2.2		12	2	7.4
	13	13	26.6		5	4	36.5		25	20	19.6		15	15	30.8
	17	2	43.1		8	17	43.8		29	9	37.8				
Feb.	20	15	58.2	Apr.	12	6	52.5	July	2	22	56.2	Nov.	15	3	13.1
	24	5	13.7		15	20	0.4		6	12	15.2		18	16	36.4
	27	18	27.6		19	9	9.5		10	1	34.4		22	5	59.5
	31	7	42.0		22	22	18.0		13	14	54.2		25	19	22.5
	3	20	54.8		26	11	27.7		17	4	14.0		29	8	45.4
Mar.	7	10	8.1	May	30	0	37.0	Aug.	20	17	34.5	Dec.	2	22	8.1
	10	23	19.8		3	13	47.5		24	6	55.0		6	11	30.7
	14	12	32.0		7	2	57.7		27	20	16.0		10	0	53.1
	18	1	42.6		10	16	9.3		31	9	37.2		13	14	15.3
	21	14	53.9		14	5	20.4		3	22	58.7		17	3	37.2
Mar.	25	4	3.5	June	17	18	32.9	Sept.	7	12	20.4	Nov.	20	16	59.1
	28	17	13.9		21	7	45.1		11	1	42.3		24	6	20.5
	4	6	22.7		24	20	58.6		14	15	4.5		27	19	41.9
	7	19	32.1		28	10	11.9		18	4	26.8		31	9	2.9
	11	8	40.2		31	23	26.4		21	17	49.4				
Mar.	14	21	49.1	June	4	12	40.8	Sept.	25	7	12.0	Nov.	15	3	13.1
	18	10	56.7		8	1	56.4		28	20	34.8		18	16	36.4
	22	0	5.2		11	15	11.8		1	9	57.8		22	5	59.5

SATELLITE III.

		h	m			h	m			h	m			h	m
Jan.	4	7	10.9	Mar.	31	1	36.6	June	24	20	15.1	Sept.	18	23	13.3
	11	11	6.1		7	4	53.3		2	0	14.2				
	18	14	56.4		14	8	10.8		9	4	17.2				
	25	18	42.0		21	11	30.6		16	8	24.2				
	1	22	23.0		28	14	52.6		23	12	34.0				
Feb.	9	1	59.5	May	5	18	17.8	Aug.	30	16	47.0	Nov.	15	10	48.9
	16	5	32.1		12	21	46.9		6	21	1.9		22	15	13.7
	23	9	0.2		20	1	20.4		14	1	19.1		29	19	37.2
	2	12	25.0		27	4	58.9		21	5	38.4		6	23	59.5
	9	15	45.8		3	8	41.8		28	9	59.7		14	4	20.5
Mar.	16	19	4.1	June	10	12	28.8	Sept.	4	14	23.1	Nov.	21	8	39.0
	23	22	20.7		17	16	19.9		11	18	47.5		28	12	55.4

SATELLITE IV.

		h	m			h	m			h	m			h	m
Jan.	17	13	48.1	Apr.	27	8	0.8	Aug.	5	15	49.9	Nov.	14	17	53.7
	Feb. 3	6	29.3		May 13	23	10.1		22	11	36.5		1	14	14.6
	19	22	11.3		30	15	10.9		8	7	45.4		18	10	15.1
Mar.	8	13	3.4	June	16	8	7.4	Sept.				Dec.			
	25	3	22.5		July 3	1	58.2								
Apr.	10	17	32.7		19	20	34.8								

## WASHINGTON MEAN TIME.

## JANUARY.

d	h	m	s				d	h	m	s				d	h	m	s			
1	1	57		II.	Tr.	In.	11	9	57		III.	Oc.	Dis.	21	22	40		III.	Sh.	In.
	2	13		II.	Sh.	Eg.		12	15		III.*	Oc.	Re.	22	1	24		III.	Sh.	Eg.
	4	37		II.	Tr.	Eg.		15	18		II.*	Sh.	In.		3	39		III.	Tr.	In.
	5	45	57	I.	Ec.	Dis.		17	45		II.*	Tr.	In.		5	53		III.	Tr.	Eg.
	9	12		I.	Oc.	Re.		18	3		II.*	Sh.	Eg.		7	8		II.	Sh.	In.
2	2	53		I.	Sh.	In.		20	25		II.	Tr.	Eg.		9	29		II.	Tr.	In.
	4	7		I.	Tr.	In.		20	35	19	I.	Ec.	Dis.		9	52		II.	Sh.	Eg.
	5	9		I.	Sh.	Eg.	12	0	1		I.	Oc.	Re.		11	24	41	I.	Ec.	Dis.
	6	21		I.	Tr.	Eg.		17	43		I.*	Sh.	In.		12	8		II.*	Tr.	Eg.
	17	45	48	II.*	Ec.	Dis.		18	56		I.	Tr.	In.		14	47		I.*	Oc.	Re.
	22	56		II.	Oc.	Re.		19	58		I.	Sh.	Eg.	23	8	33		I.	Sh.	In.
3	0	14	10	I.	Ec.	Dis.		21	10		I.	Tr.	Eg.		9	43		I.	Tr.	In.
	3	40		I.	Oc.	Re.	13	9	38	13	II.	Ec.	Dis.		10	48		I.	Sh.	Eg.
	21	21		I.	Sh.	In.		14	47		II.*	Oc.	Re.		11	57		I.*	Tr.	Eg.
	22	35		I.	Tr.	In.		15	3	31	I.*	Ec.	Dis.	24	1	31	52	II.	Ec.	Dis.
	23	37		I.	Sh.	Eg.		18	29		I.*	Oc.	Re.		5	52	54	I.	Ec.	Dis.
4	0	50		I.	Tr.	Eg.	14	12	11		I.*	Sh.	In.		6	33		II.	Oc.	Re.
	0	55	13	III.	Ec.	Dis.		13	24		I.*	Tr.	In.		9	14		I.	Oc.	Re.
	3	30	34	III.	Ec.	Re.		14	27		I.*	Sh.	Eg.	25	3	1		I.	Sh.	In.
	6	1		III.	Oc.	Dis.		15	38		I.*	Tr.	Eg.		4	11		I.	Tr.	In.
	8	21		III.	Oc.	Re.		18	42		III.*	Sh.	In.		5	17		I.	Sh.	Eg.
	12	45		II.*	Sh.	In.		21	27		III.	Sh.	Eg.		6	25		I.	Tr.	Eg.
	15	13		II.*	Tr.	In.		23	49		III.	Tr.	In.		9	11		IV.	Sh.	In.
	15	30		II.*	Sh.	Eg.	15	2	6		III.	Tr.	Eg.		10	5		IV.	Sh.	Eg.
	16	54		II.*	Tr.	Eg.		4	35		II.	Sh.	In.		12	48	7	III.*	Ec.	Dis.
	18	42	24	I.*	Ec.	Dis.		7	0		II.	Tr.	In.		15	19	50	III.*	Ec.	Re.
	22	9		I.	Oc.	Re.		7	19		II.	Sh.	Eg.		17	36		III.*	Oc.	Dis.
5	15	49		I.*	Sh.	In.		9	31	47	I.	Ec.	Dis.		19	48		III.	Oc.	Re.
	17	3		I.*	Tr.	In.		9	40		II.	Tr.	Eg.		20	24		II.	Sh.	In.
	18	5		I.*	Sh.	Eg.		12	56		I.*	Oc.	Re.		22	42		II.	Tr.	In.
	19	18		I.	Tr.	Eg.	16	6	39		I.	Sh.	In.		23	8		II.	Sh.	Eg.
6	7	2	57	II.	Ec.	Dis.		7	52		I.	Tr.	In.	26	0	21	7	I.	Ec.	Dis.
	12	13		II.	Oc.	Re.		8	55		I.	Sh.	Eg.		1	22		II.	Tr.	Eg.
	13	10	36	I.*	Ec.	Dis.		10	6		I.	Tr.	Eg.		3	42		I.	Oc.	Re.
	16	37		I.*	Oc.	Re.		22	56	23	II.	Ec.	Dis.		21	29		I.	Sh.	In.
7	10	18		I.	Sh.	In.	17	3	59	59	I.	Ec.	Dis.		22	38		I.	Tr.	In.
	11	32		I.	Tr.	In.		4	3		II.	Oc.	Re.		23	45		I.	Sh.	Eg.
	12	33		I.*	Sh.	Eg.		7	24		I.	Oc.	Re.	27	0	52		I.	Tr.	Eg.
	13	46		I.*	Tr.	Eg.	18	1	8		I.	Sh.	In.		14	49	8	II.*	Ec.	Dis.
	14	44		III.*	Sh.	In.		2	20		I.	Tr.	In.		18	49	20	I.	Ec.	Dis.
	17	31		III.*	Sh.	Eg.		3	23		I.	Sh.	Eg.		19	47		II.	Oc.	Re.
	19	55		III.	Tr.	In.		4	34		I.	Tr.	Eg.		22	9		I.	Oc.	Re.
	22	14		III.	Tr.	Eg.		8	50	46	III.	Ec.	Dis.	28	15	58		I.*	Sh.	In.
8	2	2		II.	Sh.	In.		11	23	42	III.	Ec.	Re.		17	6		I.*	Tr.	In.
	4	29		II.	Tr.	In.		13	49		III.*	Oc.	Dis.		18	13		I.*	Sh.	Eg.
	4	46		II.	Sh.	Eg.		16	4		III.*	Oc.	Re.		19	20		I.	Tr.	Eg.
	7	10		II.	Tr.	Eg.		17	51		II.*	Sh.	In.	29	2	38		III.	Sh.	In.
	7	38	52	I.	Ec.	Dis.		20	15		II.	Tr.	In.		5	21		III.	Sh.	Eg.
	11	5		I.	Oc.	Re.		20	36		II.	Sh.	Eg.		7	25		III.	Tr.	In.
	15	5		IV.*	Sh.	In.		22	28	13	I.	Ec.	Dis.		9	36		III.	Tr.	Eg.
	16	23		IV.*	Sh.	Eg.		22	55		II.	Tr.	Eg.		9	41		II.	Sh.	In.
9	4	46		I.	Sh.	In.	19	1	52		I.	Oc.	Re.		11	55		II.*	Tr.	In.
	6	0		I.	Tr.	In.		19	36		I.	Sh.	In.		12	25		II.*	Sh.	Eg.
	7	2		I.	Sh.	Eg.		20	48		I.	Tr.	In.		13	17	36	I.*	Ec.	Dis.
	8	14		I.	Tr.	Eg.		21	52		I.	Sh.	Eg.		14	34		II.*	Tr.	Eg.
	20	21	2	II.	Ec.	Dis.		23	2		I.	Tr.	Eg.		16	36		I.*	Oc.	Re.
10	1	31		II.	Oc.	Re.	20	12	13	36	II.*	Ec.	Dis.	30	10	26		I.	Sh.	In.
	2	7	5	I.	Ec.	Dis.		16	56	25	I.*	Ec.	Dis.		11	33		I.*	Tr.	In.
	5	33		I.	Oc.	Re.		17	18		II.*	Oc.	Re.		12	42		I.*	Sh.	Eg.
	23	14		I.	Sh.	In.		20	20		I.	Oc.	Re.		13	47		I.*	Tr.	Eg.
11	0	28		I.	Tr.	In.	21	14	4		I.*	Sh.	In.	31	4	7	29	II.	Ec.	Dis.
	1	30		I.	Sh.	Eg.		15	16		I.*	Tr.	In.		7	45	49	I.	Ec.	Dis.
	2	42		I.	Tr.	Eg.		16	20		I.*	Sh.	Eg.		9	1		II.	Oc.	Re.
	4	53	18	III.	Ec.	Dis.		17	30		I.*	Tr.	Eg.		11	4		I.*	Oc.	Re.
	7	27	27	III.	Ec.	Re.														

NOTE.—In. denotes ingress; Eg. egress; Dis. disappearance; Re. reappearance; Ec. eclipse.

Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

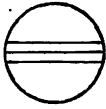
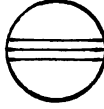
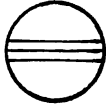
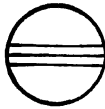
[Eph 10]



WASHINGTON MEAN TIME.

JANUARY.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I.	d *		III.	d *      r *	
II.	d *		IV. No Eclipse.		

*Configurations at 15<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1		3'	2'		○	I'	4'	
2		3'	I'	2'	○			4'
3			3'		○	I'	2'	4'
4				I'	○	3'		4'
5			2'		○	I'	3'	4'
6					○	2'	3'	4' I' ●
7				I'	○	3'	2'	4'
8		3'	2'		○	I'	4'	
9		3'		I' 4'	○			
10		4'	3'		○	I'	2'	
11		4'		I'	○	3'		
12	4'		2'		○	I'	3'	
13	4'			I'	○	2'	3'	
14	○ I'	4'			○	3'	2'	
15		4'	3'	2'	○	I'		
16		3'	4'	2' I'	○			
17			3'		○	I'	2'	
18				I'	○	2'	4'	3' ●
19			2'		○	I'	3'	4'
20				I'	○		3'	4' 2' ●
21					○	I'	3' 2'	4'
22			3'	2'	○	I'		4'
23		3'	2'	I'	○			4'
24			3'		○	I' 2'	4'	
25				I'	○	4'	2'	3' ●
26			2' 4'		○	I'	3'	
27		4'		I'	○		3'	2' ●
28	4'				○	I'	3' 2'	
29	4'		3'	2'	○			I' ●
30	4'		3'	2'	○			
31		4'	3'		○	I' 2'		

## WASHINGTON MEAN TIME.

## FEBRUARY.

d h m s	I.	Sh.	In.	d h m s	I.	Tr.	In.	d h m s	I.	Ec.	Dis.
1 4 55	I.	Sh.	In.	10 2 16	I.	Tr.	In.	19 18 56 34	I.	Ec.	Dis.
6 1	I.	Tr.	In.	3 32	I.	Sh.	Eg.	19 1	II.	Tr.	In.
7 10	I.	Sh.	Eg.	4 30	I.	Tr.	Eg.	20 3	II.	Sh.	Eg.
8 14	I.	Tr.	Eg.	20 0 37	II.	Ec.	Dis.	20 17	III.	Tr.	Eg.
16 45 26	III.*	Ec.	Dis.	22 35 15	I.	Ec.	Dis.	21 39	II.	Tr.	Eg.
19 15 56	III.	Ec.	Re.	11 0 39	II.	Oc.	Re.	21 58	I.	Oc.	Re.
21 18	III.	Oc.	Dis.	1 45	I.	Oc.	Re.	20 16 7	I.*	Sh.	In.
22 57	II.	Sh.	In.	19 45	I.	Sh.	In.	16 57	I.*	Tr.	In.
23 28	III.	Oc.	Re.	20 43	I.	Tr.	In.	18 22	I.	Sh.	Eg.
2 1 8	II.	Tr.	In.	22 0	I.	Sh.	Eg.	19 10	I.	Tr.	Eg.
1 41	II.	Sh.	Eg.	22 57	I.	Tr.	Eg.	21 11 55 7	II.*	Ec.	Dis.
2 14 3	I.	Ec.	Dis.	12 10 35	III.*	Sh.	In.	13 24 51	I.*	Ec.	Dis.
3 46	II.	Tr.	Eg.	13 15	III.*	Sh.	Eg.	16 13	II.*	Oc.	Re.
5 31	I.	Oc.	Re.	14 42	III.*	Tr.	In.	16 25	I.*	Oc.	Re.
23 23	I.	Sh.	In.	14 47	II.*	Sh.	In.	22 10 35	I.*	Sh.	In.
8 0 28	I.	Tr.	In.	16 42	II.*	Tr.	In.	11 24	I.*	Tr.	In.
1 38	I.	Sh.	Eg.	16 48	III.*	Tr.	Eg.	12 51	I.*	Sh.	Eg.
2 42	I.	Tr.	Eg.	17 3 31	I.*	Ec.	Dis.	13 37	I.*	Tr.	Eg.
17 24 48	II.*	Ec.	Dis.	17 30	II.*	Sh.	Eg.	23 4 39 0	III.	Ec.	Dis.
20 42 16	I.	Ec.	Dis.	19 20	II.	Tr.	Eg.	6 36	II.	Sh.	In.
22 14	II.	Oc.	Re.	20 12	I.	Oc.	Re.	7 5 47	III.	Ec.	Re.
23 58	I.	Oc.	Re.	13 14 13	I.*	Sh.	In.	7 53 9	I.	Ec.	Dis.
4 17 51	I.*	Sh.	In.	15 10	I.*	Tr.	In.	7 58	III.	Oc.	Dis.
18 55	I.	Tr.	In.	16 29	I.*	Sh.	Eg.	8 10	II.	Tr.	In.
20 7	I.	Sh.	Eg.	17 24	I.*	Tr.	Eg.	9 20	II.	Sh.	Eg.
21 9	I.	Tr.	Eg.	14 9 19 6	II.	Ec.	Dis.	10 2	III.*	Oc.	Re.
5 6 37	III.	Sh.	In.	11 31 47	I.*	Ec.	Dis.	10 48	II.*	Tr.	Eg.
9 18	III.	Sh.	Eg.	13 51	II.*	Oc.	Re.	10 51	I.*	Oc.	Re.
11 6	III.*	Tr.	In.	14 39	I.*	Oc.	Re.	24 5 4	I.	Sh.	In.
12 14	II.*	Sh.	In.	15 8 42	I.	Sh.	In.	5 50	I.	Tr.	In.
13 14	III.*	Tr.	Eg.	9 37	I.	Tr.	In.	7 19	I.	Sh.	Eg.
14 19	II.*	Tr.	In.	10 57	I.*	Sh.	Eg.	8 4	I.	Tr.	Eg.
14 58	II.*	Sh.	Eg.	11 50	I.*	Tr.	Eg.	25 1 12 36	II.	Ec.	Dis.
15 10 32	I.*	Ec.	Dis.	16 0 41 6	III.	Ec.	Dis.	2 21 24	I.	Ec.	Dis.
16 58	II.*	Tr.	Eg.	3 9 7	III.	Ec.	Re.	5 18	I.	Oc.	Re.
18 25	I.*	Oc.	Re.	4 3	II.	Sh.	In.	5 22	II.	Oc.	Re.
6 12 20	I.*	Sh.	In.	4 29	III.	Oc.	Dis.	23 32	I.	Sh.	In.
13 22	I.*	Tr.	In.	5 52	II.	Tr.	In.	26 0 17	I.	Tr.	In.
14 35	I.*	Sh.	Eg.	6 0 2	I.	Ec.	Dis.	1 48	I.	Sh.	Eg.
15 36	I.*	Tr.	Eg.	6 35	III.	Oc.	Re.	2 30	I.	Tr.	Eg.
7 6 43 14	II.	Ec.	Dis.	6 47	II.	Sh.	Eg.	18 30	III.	Sh.	In.
9 38 46	I.	Ec.	Dis.	8 30	II.	Tr.	Eg.	19 53	II.	Sh.	In.
11 27	II.*	Oc.	Re.	9 5	I.	Oc.	Re.	20 49 42	I.	Ec.	Dis.
12 52	I.*	Oc.	Re.	17 3 10	I.	Sh.	In.	21 9	III.	Sh.	Eg.
8 6 48	I.	Sh.	In.	4 4	I.	Tr.	In.	21 19	II.	Tr.	In.
7 50	I.	Tr.	In.	5 25	I.	Sh.	Eg.	21 39	III.	Tr.	In.
9 4	I.	Sh.	Eg.	6 17	I.	Tr.	Eg.	22 36	II.	Sh.	Eg.
10 3	I.	Tr.	Eg.	22 36 32	II.	Ec.	Dis.	23 43	III.	Tr.	Eg.
20 42 56	III.	Ec.	Dis.	18 0 28 17	I.	Ec.	Dis.	23 44	I.	Oc.	Re.
23 12 12	III.	Ec.	Re.	3 2	II.	Oc.	Re.	23 57	II.	Tr.	Eg.
9 0 56	III.	Oc.	Dis.	3 32	I.	Oc.	Re.	27 18 1	I.*	Sh.	In.
1 30	II.	Sh.	In.	21 38	I.	Sh.	In.	18 43	I.	Tr.	In.
3 3	III.	Oc.	Re.	22 30	I.	Tr.	In.	20 16	I.	Sh.	Eg.
3 31	II.	Tr.	In.	23 54	I.	Sh.	Eg.	20 56	I.	Tr.	Eg.
4 7 1	I.	Ec.	Dis.	19 0 44	I.	Tr.	Eg.	28 14 31 16	II.*	Ec.	Dis.
4 14	II.	Sh.	Eg.	14 32	III.*	Sh.	In.	15 18 1	I.*	Ec.	Dis.
6 9	II.	Tr.	Eg.	17 12	III.*	Sh.	Eg.	18 10	I.	Oc.	Re.
7 19	I.	Oc.	Re.	17 20	II.*	Sh.	In.	18 33	II.	Oc.	Re.
10 1 16	I.	Sh.	In.	18 12	III.*	Tr.	In.				

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

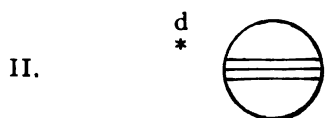
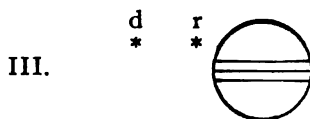
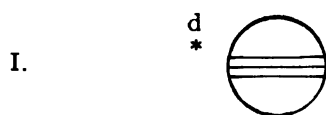
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

[Eph 10]

## WASHINGTON MEAN TIME.

### FEBRUARY.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*



*Configurations at 14<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.			East.		
1		4	1' 3	○	2'	
2			2' 4	○	1' 3	
3			1' 2	○	4	3
4				○	1'	2' 3' 4
5			1' 3	○		4
6	○ 1'	3'	2	○		4
7		3		○	1'	4'
8			3' 1'	○	2'	4'
9			2'	○	1' 3	4'
10			1'	○	4'	3
11				○	1' 2' 3'	
12		4'	1	○	3' 2'	
13		4'	3' 2'	○	1'	
14	4'	3		○	2	1 ●
15	4'		3' 1'	○	2'	
16	4		2'	○	3' 1	
17		4	21'	○		3
18		4		○	1' 2	3'
19			1' 4	○	3' 2'	
20		3'		○	1'	4
21		3'		○		4 1 ● 2 ●
22			3' 1'	○	2'	4
23			2'	○	3' 1	4
24			2' 1'	○		3 4'
25				○	3' 1	4'
26			1	○	3' 2'	4'
27		3'		○	1' 4'	
28		3'	4' 1	○		

# WASHINGTON MEAN TIME.

## MARCH.

d	h	m	s				d	h	m	s				d	h	m	s			
1	12	29		I.*	Sh.	In.	11	8	47		I.*	Oc.	Re.	21	20	58	8	I.	Ec.	Dis.
13	10			I.*	Tr.	In.		9	59		II.*	Oc.	Re.		22	20	23	II.	Ec.	Dis.
14	45			I.*	Sh.	Eg.	12	3	20		I.	Sh.	In.		23	22		I.	Oc.	Re.
15	23			I.*	Tr.	Eg.		3	47		I.	Tr.	In.	22	1	24		II.	Oc.	Re.
2	8	37	23	III.	Ec.	Dis.		5	35		I.	Sh.	Eg.		18	11		I.	Sh.	In.
	9	9		II.*	Sh.	In.		6	0		I.	Tr.	Eg.		18	23		I.	Tr.	In.
	9	46	18	I.*	Ec.	Dis.	13	0	36	17	I.	Ec.	Dis.		20	26		I.	Sh.	Eg.
	10	28		II.*	Tr.	In.		1	0		II.	Sh.	In.		20	37		I.	Tr.	Eg.
	11	2	56	III.*	Ec.	Re.		1	51		II.	Tr.	In.	23	15	26	31	I.*	Ec.	Dis.
	11	23		III.*	Oc.	Dis.		2	27		III.	Sh.	In.		16	50		II.*	Sh.	In.
	11	53		II.*	Sh.	Eg.		3	13		I.	Oc.	Re.		17	11		II.*	Tr.	In.
	12	36		I.*	Oc.	Re.		3	42		II.	Sh.	Eg.		17	48		I.	Oc.	Re.
	13	5		II.*	Tr.	Eg.		4	22		III.	Tr.	In.		19	32		II.	Sh.	Eg.
	13	27		III.*	Oc.	Re.		4	28		II.	Tr.	Eg.		19	49		II.	Tr.	Eg.
3	6	58		I.	Sh.	In.		5	3		III.	Sh.	Eg.		20	31	9	III.	Ec.	Dis.
	7	36		I.	Tr.	In.		6	27		III.	Tr.	Eg.		23	24		III.	Oc.	Re.
	9	13		I.*	Sh.	Eg.		21	49		I.	Sh.	In.	24	12	40		I.*	Sh.	In.
	9	49		I.*	Tr.	Eg.		22	13		I.	Tr.	In.		12	49		I.*	Tr.	In.
4	3	48	48	II.	Ec.	Dis.	14	0	4		I.	Sh.	Eg.		14	55		I.*	Sh.	Eg.
	4	14	37	I.	Ec.	Dis.		0	26		I.	Tr.	Eg.		15	3		I.*	Tr.	Eg.
	7	2		I.	Oc.	Re.		19	4	39	I.	Ec.	Dis.	25	9	54	54	I.*	Ec.	Dis.
	7	42		II.	Oc.	Re.		19	43	54	II.	Ec.	Dis.		11	38	7	II.*	Ec.	Dis.
5	1	26		I.	Sh.	In.		21	39		I.	Oc.	Re.		12	14		I.*	Oc.	Re.
	2	2		I.	Tr.	In.		23	8		II.	Oc.	Re.		14	31		II.*	Oc.	Re.
	3	41		I.	Sh.	Eg.	15	16	17		I.*	Sh.	In.	26	7	8		I.*	Sh.	In.
	4	15		I.	Tr.	Eg.		16	39		I.*	Tr.	In.		7	15		I.*	Tr.	In.
	22	26		II.	Sh.	In.		18	32		I.	Sh.	Eg.		9	23		I.*	Sh.	Eg.
	22	28		III.	Sh.	In.		18	54		I.	Tr.	Eg.		9	29		I.*	Tr.	Eg.
	22	42	56	I.	Ec.	Dis.	16	13	33	0	I.*	Ec.	Dis.	27	4	23	19	I.	Ec.	Dis.
	23	36		II.	Tr.	In.		14	16		II.*	Sh.	In.		6	6		II.	Sh.	In.
6	1	2		III.	Tr.	In.		14	58		II.*	Tr.	In.		6	18		II.	Tr.	In.
	1	6		III.	Sh.	Eg.		16	5		I.*	Oc.	Re.		6	40		I.	Oc.	Re.
	1	9		II.	Sh.	Eg.		16	33	9	III.*	Ec.	Dis.		8	49		II.*	Sh.	Eg.
	1	28		I.	Oc.	Re.		16	59		II.*	Sh.	Eg.		8	56		II.*	Tr.	Eg.
	2	13		II.	Tr.	Eg.		17	35		II.*	Tr.	Eg.		10	25		III.*	Sh.	In.
	3	6		III.	Tr.	Eg.		20	6		III.	Oc.	Re.		10	55		III.*	Tr.	In.
	19	55		I.	Sh.	In.	17	10	46		I.*	Sh.	In.		12	58		III.*	Sh.	Eg.
	20	28		I.	Tr.	In.		11	5		I.*	Tr.	In.		13	4		III.*	Tr.	Eg.
	22	10		I.	Sh.	Eg.		13	1		I.*	Sh.	Eg.	28	1	37		I.	Sh.	In.
	22	42		I.	Tr.	Eg.		13	20		I.*	Tr.	Eg.		1	41		I.	Tr.	In.
7	17	7	31	II.*	Ec.	Dis.	18	8	1	21	I.*	Ec.	Dis.		3	52		I.	Sh.	Eg.
	17	11	17	I.*	Ec.	Dis.		9	1	34	II.*	Ec.	Dis.		3	55		I	Tr.	Eg.
	19	55		I.	Oc.	Re.		10	30		I.*	Oc.	Re.		22	51	46	I.	Ec.	Dis.
	20	51		II.	Oc.	Re.		12	15		II.*	Oc.	Re.	29	0	56	58	II.	Ec.	Dis.
8	14	23		I.*	Sh.	In.	19	5	14		I.	Sh.	In.		1	6		I	Oc.	Re.
	14	55		I.*	Tr.	In.		5	31		I.	Tr.	In.		3	40		II.	Oc.	Re.
	16	38		I.*	Sh.	Eg.		7	29		I.	Sh.	Eg.		20	6		I.	Sh.	In.
	17	8		I.*	Tr.	Eg.		7	45		I.*	Tr.	Eg.		20	7		I.	Tr.	In.
9	11	39	36	I.*	Ec.	Dis.	20	2	29	44	I.	Ec.	Dis.		22	21		I.	Sh.	Eg.
	11	43		II.*	Sh.	In.		3	33		II.	Sh.	In.		22	21		I.	Tr.	Eg.
	12	35	16	III.*	Ec.	Dis.		4	5		II.	Tr.	In.	30	17	18		I.*	Oc.	Dis.
	12	43		II.*	Tr.	In.		4	56		I.	Oc.	Re.		19	23		II.	Sh.	In.
	14	21		I.*	Oc.	Re.		6	16		II.	Sh.	Eg.		19	25		II.	Tr.	In.
	14	26		II.*	Sh.	Eg.		6	26		III.	Sh.	In.		19	32		I.	Oc.	Re.
	15	21		II.*	Tr.	Eg.		6	42		II.	Tr.	Eg.		22	3		II.	Tr.	Eg.
	16	48		III.*	Oc.	Re.		7	39		III.*	Tr.	In.		22	6		II.	Sh.	Eg.
10	8	52		I.*	Sh.	In.		9	1		III.*	Sh.	Eg.	31	0	29	24	III.	Ec.	Dis.
	9	21		I.*	Tr.	In.		9	45		III.*	Tr.	Eg.		2	49	54	III.	Ec.	Re.
	11	7		I.*	Sh.	Eg.		23	43		I.	Sh.	In.		14	33		I.*	Tr.	In.
	11	34		I.*	Tr.	Eg.		23	57		I.	Tr.	In.		14	34		I.*	Sh.	In.
11	6	7	56	I.	Ec.	Dis.	21	1	58		I.	Sh.	Eg.		16	47		I.*	Tr.	Eg.
	6	25	8	II.	Ec.	Dis.		2	11		I.	Tr.	Eg.		16	49		I.*	Sh.	Eg.

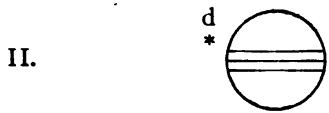
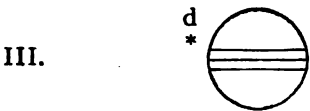
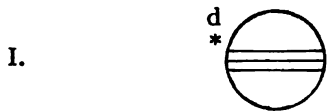
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.  
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

[Eph 10]

WASHINGTON MEAN TIME.

MARCH.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*



*Configurations at 13<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.	East.
1	4' 3'	1' 2'
2	2' 4'	1' 3'
3	4' 2' 1'	3'
4	4'	1' 3'
5	4' 1'	1' 3'
6	4' 2' 3'	1'
7	3' 4' 1' 2'	
8	3'	1' 2'
9	2' 4'	1' 3' 3'
10	2' 1'	3' 4'
11	1'	2' 1' 3' 4'
12	2' 3'	1' 4'
13	3' 1'	4'
14	3'	1' 2' 4'
15	3' 1' 2' 4'	3'
16	4' 2' 3'	1' 3'
17	4' 3' 1'	2' 3'
18	4' 2' 1'	3'
19	4' 3' 1'	1' 2'
20	4' 3' 1'	2' 3' 4'
21	4' 3' 1'	2' 3' 4'
22	4' 3' 1'	2' 3' 4'
23	4' 3' 1'	2' 3' 4'
24	4' 3' 1'	2' 3' 4'
25	4' 3' 1'	2' 3' 4'
26	4' 3' 1'	2' 3' 4'
27	4' 3' 1'	2' 3' 4'
28	4' 3' 1'	2' 3' 4'
29	4' 3' 1'	2' 3' 4'
30	4' 3' 1'	2' 3' 4'
31	4' 3' 1'	2' 3' 4'

# WASHINGTON MEAN TIME.

## APRIL.

d	h	m	s				d	h	m	s				d	h	m	s						
1	11	44		I.*	Oc.	Dis.	11	5	10		I.	Tr.	In.	21	5	48		II.	Sh.	Eg.			
	13	58	30	I.*	Ec.	Re.		5	26		I.	Sh.	In.		10	21		III.*	Oc.	Dis.			
	14	9		II.*	Oc.	Dis.		7	23		I.	Tr.	Eg.		14	43	8	III.*	Ec.	Re.			
	16	53	55	II.*	Ec.	Re.		7	41		I.	Sh.	Eg.		19	47		I.	Tr.	In.			
2	8	59		I.*	Tr.	In.	12	2	19		I.	Oc.	Dis.		20	18		I.	Sh.	In.			
	9	3		I.*	Sh.	In.		4	49	14	I.	Ec.	Re.		22	1		I.	Tr.	Eg.			
	11	13		I.*	Tr.	Eg.		5	33		II.	Oc.	Dis.		22	32		I.	Sh.	Eg.			
	11	18		I.*	Sh.	Eg.		8	49	12	II.*	Ec.	Re.		22	16	56	I.	Oc.	Dis.			
3	6	10		I.	Oc.	Dis.		23	36		I.	Tr.	In.		19	40	15	I.	Ec.	Re.			
	8	26	56	I.*	Ec.	Re.		23	55		I.	Sh.	In.		20	59		II.	Oc.	Dis.			
	8	31		II.*	Tr.	In.	13	1	50		I.	Tr.	Eg.		23	0	43	32	II.	Ec.	Re.		
	8	40		II.*	Sh.	In.		2	9		I.	Sh.	Eg.		14	13		I.*	Tr.	In.			
	11	10		II.*	Tr.	Eg.		20	45		I.	Oc.	Dis.		14	46		I.*	Sh.	In.			
	11	23		II.*	Sh.	Eg.		23	17	42	I.	Ec.	Re.		16	28		I.	Tr.	Eg.			
	14	10		III.*	Tr.	In.		23	52		II.	Tr.	In.		17	1		I.	Sh.	Eg.			
	14	23		III.*	Sh.	In.	14	0	31		II.	Sh.	In.		24	11	22	I.*	Oc.	Dis.			
	16	21		III.*	Tr.	Eg.		2	31		II.	Tr.	Eg.		14	8	46	I.*	Ec.	Re.			
	16	56		III.*	Sh.	Eg.		3	14		II.	Sh.	Eg.		15	15		II.*	Tr.	In.			
4	3	25		I.	Tr.	In.		7	3		III.*	Oc.	Dis.		16	23		II.	Sh.	In.			
	3	31		I.	Sh.	In.		10	45	8	III.*	Ec.	Re.		17	55		II.	Tr.	Eg.			
	5	39		I.	Tr.	Eg.		18	2		I.	Tr.	In.		19	5		II.	Sh.	Eg.			
	5	46		I.	Sh.	Eg.		18	23		I.	Sh.	In.		25	0	1	III.	Tr.	In.			
5	0	36		I.	Oc.	Dis.		20	16		I.	Tr.	Eg.		2	20		III.	Sh.	In.			
	2	55	24	I.	Ec.	Re.		20	38		I.	Sh.	Eg.		2	22		III.	Tr.	Eg.			
	3	17		II.	Oc.	Dis.	16	15	12		I.*	Oc.	Dis.		4	48		III.	Sh.	Eg.			
	6	12	42	II.	Ec.	Re.		17	46	11	I.	Ec.	Re.		8	40		I.*	Tr.	In.			
	21	51		I.	Tr.	In.		18	41		II.	Oc.	Dis.		9	15		I.*	Sh.	In.			
	22	0		I.	Sh.	In.		22	6	57	II.	Ec.	Re.		10	54		I.*	Tr.	Eg.			
6	0	5		I.	Tr.	Eg.	16	12	28		I.*	Tr.	In.		11	30		I.*	Sh.	Eg.			
	0	15		I.	Sh.	Eg.		12	52		I.*	Sh.	In.		26	5	49	I.	Oc.	Dis.			
	19	2		I.	Oc.	Dis.		14	42		I.*	Tr.	Eg.		8	37	20	I.*	Ec.	Re.			
	21	23	49	I.	Ec.	Re.		15	7		I.*	Sh.	Eg.		10	8		II.*	Oc.	Dis.			
	21	38		II.	Tr.	In.	17	9	38		I.*	Oc.	Dis.		14	2	17	II.*	Ec.	Re.			
	21	57		II.	Sh.	In.		12	14	41	I.*	Ec.	Re.		27	3	6	I.	Tr.	In.			
7	0	16		II.	Tr.	Eg.		12	59		II.*	Tr.	In.		3	44		I.	Sh.	In.			
	0	40		II.	Sh.	Eg.		13	48		II.*	Sh.	In.		5	20		I.	Tr.	Eg.			
	3	47		III.	Oc.	Dis.		15	38		II.*	Tr.	Eg.		5	58		I.	Sh.	Eg.			
	6	47	37	III.	Ec.	Re.		16	30		II.*	Sh.	Eg.		28	0	15	I.	Oc.	Dis.			
	16	17		I.*	Tr.	In.		20	42		III.	Tr.	In.		3	5	52	I.	Ec.	Re.			
	16	29		I.*	Sh.	In.		22	21		III.	Sh.	In.		4	23		II.	Tr.	In.			
	18	31		I.	Tr.	Eg.		22	59		III.	Tr.	Eg.		5	40		II.	Sh.	In.			
	18	44		I.	Sh.	Eg.	18	0	51		III.	Sh.	Eg.		7	3		II.	Tr.	Eg.			
8	13	28		I.*	Oc.	Dis.		6	54		I.	Tr.	In.		8	22		II.*	Sh.	Eg.			
	15	52	16	I.*	Ec.	Re.		7	20		I.*	Sh.	In.		13	41		III.*	Oc.	Dis.			
	16	24		II.*	Oc.	Dis.		9	8		I.*	Tr.	Eg.		16	4		III.	Oc.	Re.			
	19	30	25	II.	Ec.	Re.		9	35		I.*	Sh.	Eg.		16	25	17	III.	Ec.	Dis.			
9	10	44		I.*	Tr.	In.	19	4	4		I.	Oc.	Dis.		18	40	40	III.	Ec.	Re.			
	10	57		I.*	Sh.	In.		6	43	13	I.	Ec.	Re.		21	33		I.	Tr.	In.			
	12	57		I.*	Tr.	Eg.		7	50		II.*	Oc.	Dis.		22	12		I.	Sh.	In.			
	13	12		I.*	Sh.	Eg.		11	25	44	II.*	Ec.	Re.		23	47		I.	Tr.	Eg.			
10	7	54		I.*	Oc.	Dis.	20	1	21		I.	Tr.	In.		29	0	27	I.	Sh.	Eg.			
	10	20	44	I.*	Ec.	Re.		1	49		I.	Sh.	In.		18	41		I.	Oc.	Dis.			
	10	45		II.*	Tr.	In.		3	35		I.	Tr.	Eg.		21	34	25	I.	Ec.	Re.			
	11	14		II.*	Sh.	In.		4	4		I.	Sh.	Eg.		23	17		II.	Oc.	Dis.			
	13	24		II.*	Tr.	Eg.		22	30		I.	Oc.	Dis.		30	3	20	6	II.	Ec.	Re.		
	13	57		II.*	Sh.	Eg.	21	1	11	43	I.	Ec.	Re.		15	59		I.	Tr.	In.			
	17	25		III.	Tr.	In.		2	7		II.	Tr.	In.		16	41		I.	Sh.	In.			
	18	22		III.	Sh.	In.		3	5		II.	Sh.	In.		18	14		I.	Tr.	Eg.			
	19	40		III.	Tr.	Eg.		4	46		II.	Tr.	Eg.		18	56		I.	Sh.	Eg.			
	20	53		III.	Sh.	Eg.																	

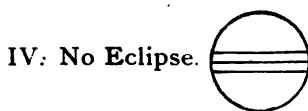
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.  
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington

[Eph 10]

WASHINGTON MEAN TIME.

APRIL.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*



*Configurations at 11<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.	West.	East.
1		2 1
2		1 4
3	4	2 3 1
4	4 3 2 1	
5	4 3	2 1
6	4 3 1	2
7	4 2	3 1
8	4	1 3
9	1 4	2 3
10	2 4	1 3
11	3 1	4
12	3	2 1 4
13	3 1	2 4
14	2	3 1 4
15	2 1	3 4
16	1	2 3 4
17	2 3 1	4 1
18	3 4	2 1
19	4 3 1	2
20	4 3	1
21	4	1 3
22	4 2 1	3
23	4	1 2 3
24	4	2 3 1
25	4 2 3 1	
26	3 4	1 2
27	3 1	4 2
28	2 3	1 4
29	2 1	3 4
30		1 2 3 4

## WASHINGTON MEAN TIME.

MAY.

d	h	m	s				d	h	m	s				d	h	m	s				
1	13	8		I *	Oc.	Dis.	11	9	48		I *	Sh.	Eg.	21	22	26		I	Sh.	In	
16	2	58		I	Ec.	Re.	12	3	48		I.	Oc.	Dis.		23	38		I.	Tr.	Eg	
17	32			II.	Tr.	In.		6	54	33		I.	Ec.	Re.	22	0	40		I.	Sh.	Eg
18	57			II.	Sh.	In.		9	1		II *	Tr.	In.		18	31		I	Oc.	Dis.	
20	12			II.	Tr.	Eg.		10	49		II *	Sh.	In.		21	46	20	I.	Ec.	Re.	
21	39			II.	Sh.	Eg.		11	42		II *	Tr.	Eg.	23	0	35		II.	Tr.	In	
2	3	24		III.	Tr.	In.		13	31		II *	Sh.	Eg.		2	42		II.	Sh.	In	
5	48			III.	Tr.	Eg.		20	33		III.	Oc.	Dis.		3	17		II.	Tr.	Eg	
6	20			III.	Sh.	In.		23	1		III.	Oc.	Re.		5	24		II.	Sh.	Eg.	
8	47			III.*	Sh.	Eg.	12	0	23	0	III.	Ec.	Dis.		13	55		I.L	Tr.	In.	
10	26			I *	Tr.	In.		1	7		I.	Tr.	In.		15	50		I.	Tr.	In	
11	10			I *	Sh.	In.		2	2		I.	Sh.	In.		16	28		III.	Tr.	Eg	
12	40			I *	Tr.	Eg.		2	35	49	III.	Ec.	Re.		16	54		I.	Sh.	In.	
13	25			I *	Sh.	Eg.		3	22		I.	Tr.	Eg.		18	5		I.	Tr.	Eg	
8	7	34		I *	Oc.	Dis.		4	17		I.	Sh.	Eg.		18	18		III.	Sh.	In.	
10	31	35		I *	Ec.	Re.		22	15		I.	Oc.	Dis.		19	9		I.	Sh.	Eg	
12	27			II *	Oc.	Dis.	14	1	23	10	I.	Ec.	Re.		20	41		III.	Sh.	Eg	
16	38	49		II.	Ec.	Re.		4	0		II.	Oc.	Dis.	24	12	58		I *	Oc.	Dis.	
4	4	52		I.	Tr.	In.		8	33	11	II *	Ec.	Re.		16	15	2	I.	Ec.	Re.	
5	38			I.	Sh.	In.		19	34		I.	Tr.	In.		19	38		II.	Oc.	Dis.	
7	7			I.	Tr.	Eg.		20	31		I.	Sh.	In.	25	0	28	11	II.	Ec.	Re.	
7	53			I *	Sh.	Eg.		21	49		I.	Tr.	Eg.		10	18		I *	Tr.	In.	
5	2	1		I.	Oc.	Dis.		22	45		I.	Sh.	Eg.		11	23		I *	Sh.	In.	
5	0	9		I.	Ec.	Re.	15	16	42		I.	Oc.	Dis.		12	33		I *	Tr.	Eg.	
6	41			II.	Tr.	In.		19	51	46	I.	Ec.	Re.		13	38		I	Sh.	Eg.	
8	14			II *	Sh.	In.		22	12		II.	Tr.	In.	26	7	26		I.	Oc.	Dis.	
9	22			II *	Tr.	Eg.	16	0	7		II.	Sh.	In.		10	43	40	I *	Ec.	Re.	
10	56			II *	Sh.	Eg.		0	53		II.	Tr.	Eg.		13	48		II *	Tr.	In.	
17	5			III.	Oc.	Dis.		2	48		II.	Sh.	Eg.		16	0		II.	Sh.	In.	
19	31			III.	Oc.	Re.		10	20		III.*	Tr.	In.		16	30		II.	Tr.	Eg.	
20	24	5		III.	Ec.	Dis.		12	51		III.*	Tr.	Eg.		18	41		II.	Sh.	Eg	
22	38	11		III.	Ec.	Re.		14	1		I *	Tr.	In.	27	3	42		III.	Oc.	Dis.	
23	19			I.	Tr.	In.		14	19		III.	Sh.	In.		4	46		I.	Tr.	In.	
6	0	7		I.	Sh.	In.		15	0		I.	Sh.	In.		5	52		I.	Sh.	In	
1	34			I.	Tr.	Eg.		16	16		I.	Tr.	Eg.		6	16		III.	Oc.	Re.	
2	22			I.	Sh.	Eg.		16	43		III.	Sh.	Eg.		7	0		I.	Tr.	Eg.	
20	28			I.	Oc.	Dis.		17	14		I.	Sh.	Eg.		8	6		I *	Sh.	Eg.	
23	28	44		I.	Ec.	Re.	17	11	9		I *	Oc.	Dis.		8	22	1	III.*	Ec.	Dis.	
7	1	37		II.	Oc.	Dis.		14	20	27	I.	Ec.	Re.		10	32	15	III.*	Ec.	Re.	
5	56	40		II.	Ec.	Re.		17	12		II.	Oc.	Dis.	28	1	53		I.	Oc.	Dis	
17	46			I.	Tr.	In.		21	51	48	II.	Ec.	Re.		5	12	21	I.	Ec.	Re.	
18	36			I.	Sh.	In.	18	8	28		I *	Tr.	In.		8	51		II.*	Oc.	Dis.	
20	1			I.	Tr.	Eg.		9	28		I *	Sh.	In.		13	46	2	II.	Ec.	Re.	
20	51			I.	Sh.	Eg.		10	43		I *	Tr.	Eg.		23	13		I.	Tr.	In.	
8	14	54		I.	Oc.	Dis.		11	43		I *	Sh.	Eg.	29	0	21		I.	Sh.	In.	
17	57	19		I.	Ec.	Re.	19	5	36		I.	Oc.	Dis.		1	28		I.	Tr.	Eg.	
19	51			II.	Tr.	In.		8	49	4	I *	Ec.	Re.		2	35		I.	Sh.	Eg.	
21	32			II.	Sh.	In.		11	23		II.*	Tr.	In.		20	21		I.	Oc.	Dis.	
22	32			II.	Tr.	Eg.		13	24		II.*	Sh.	In.		23	40	59	I.	Ec.	Re.	
9	0	14		II.	Sh.	Eg.		14	5		II.	Tr.	Eg.	30	3	1		II.	Tr.	In.	
6	50			III.	Tr.	In.		16	6		II.	Sh.	Eg.		5	17		II.	Sh.	In.	
9	17			III *	Tr.	Eg.	20	0	5		III.	Oc.	Dis.		5	43		II.	Tr.	Eg.	
10	19			III.*	Sh.	In.		2	36		III.	Oc.	Re.		7	59		II.*	Sh.	Eg.	
12	13			I *	Tr.	In.		2	56		I.	Tr.	In.		17	34		III.	Tr.	In.	
12	45			III.*	Sh.	Eg.		3	57		I.	Sh.	In.		17	41		I.	Tr.	In.	
13	5			I *	Sh.	In.		4	22	9	III.	Ec.	Dis.		18	49		I.	Sh.	In.	
14	28			I *	Tr.	Eg.		5	10		I.	Tr.	Eg.		19	56		I.	Tr.	Eg.	
15	19			I.	Sh.	Eg.		6	11		I.	Sh.	Eg.		20	9		III.	Tr.	Eg.	
10	9	21		I *	Oc.	Dis.		6	33	41	III.	Ec.	Re.		21	4		I.	Sh.	Eg.	
12	25	58		I *	Ec.	Re.	21	0	4		I.	Oc.	Dis.		22	17		III.	Sh.	In.	
14	49			II.	Oc.	Dis.		3	17	43	I.	Ec.	Re.	31	0	39		III.	Sh.	Eg.	
19	15	20		II.	Ec.	Re.		6	24		II.	Oc.	Dis.		14	48		I.	Oc.	Dis.	
11	6	40		I.	Tr.	In.		11	9	38	II.*	Ec.	Re.		18	9	42	I.	Ec.	Re.	
7	33			I *	Sh.	In.		21	23		I.	Tr.	In.		22	5		II.	Oc.	Dis.	
8	55			I *	Tr.	Eg.															

NOTE. In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

[Eph 10]

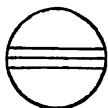


WASHINGTON MEAN TIME.

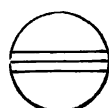
MAY.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

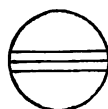
I.



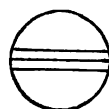
III.



II.



IV. No Eclipse.



*Configurations at 11<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1				'1	○	2'	3'	'4
2	○ 1'		2'	3'	○			4'
3		3'		'2	○	'1		4'
4		'3		1'	○		'2 4'	
5				'32'	○	4'	'1	
6			4'	'1	○		'3	
7		4'			○	1'	'3	
8	4'	4'		'1	○	2'	3'	'3
9	4'		2'	3'	○	1'		
10	'4	3'		'2	○			'1 ●
11	'4	'3		1'	○		'2	
12	○ 2'	'4		'3	○	'1		
13		'2	1' 4'		○		'3	
14					○	'2 4'	'3	
15				'1	○	2'	3'	'4
16	○ 3'		2'		○	1'		4'
17		3'	'2	1'	○			4'
18		'3		1'	○	'2		4'
19			'3		○	2'	'1	4'
20		'2	1'		○	'3		4'
21					○	'1 4'	'3	'2 ●
22			'1	4'	○	2'	3'	
23		4'	2'		○	3' 1'		
24		4'	3'	'2	○			
25	○ 1' 4'	'3		'1	○		'2	
26	4'		'3		○	1'		
27	'4		2'	1'	○	'3		
28		'4			○	'1	'3	'2 ●
29		'4	'1		○	2'	3'	
30			2'	4'	○	3' 1'		
31		3' 2'	'1		○		4'	

WASHINGTON MEAN TIME.												
JUNE.												
d h m s	II.	Ec.	Re.	d h m s	III.	Ec.	Dis.	d h m s	I.	Sh.	In.	
1 3 4 30	I.*	Tr.	In.	10 16 21 31	III.	Ec.	Re.	21 0 34	I.	Sh.	In.	
12 8	I.	Sh.	In.	18 29 41	I.	Ec.	Dis.	1 33	I.	Tr.	Eg.	
13 18	I.	Tr.	Eg.	11 5 36	I.*	Ec.	Re.	2 48	I.	Sh.	Eg.	
14 23	I.	Sh.	Eg.	9 1 51	II.	Ec.	Dis.	4 59	III.	Tr.	In.	
15 32				13 50				7 39	III.	Tr.	Eg.	
2 9 16	I.*	Oc.	Dis.	18 58 29	II.	Ec.	Re.	10 16	III.*	Sh.	In.	
12 38 22	I.*	Ec.	Re.	12 2 56	I.	Tr.	In.	12 35	III.	Sh.	Eg.	
16 14	II.	Tr.	In.	4 10	I.	Sh.	In.	20 26	I.	Oc.	Dis.	
18 35	II.	Sh.	In.	5 11	I.	Tr.	Eg.	23 54 9	I.	Ec.	Re.	
18 57	II.	Tr.	Eg.	6 25	I.	Sh.	Eg.	22 5 40	II.	Oc.	Dis.	
21 16	II.	Sh.	Eg.	13 0 4	I.	Oc.	Dis.	10 52 42	II.*	Ec.	Re.	
3 6 36	I.	Tr.	In.	3 30 30	I.	Ec.	Re.	17 47	I.	Tr.	In.	
7 24	III.	Oc.	Dis.	7 59	II.*	Tr.	In.	19 3	I.	Sh.	In.	
7 47	I.*	Sh.	In.	10 29	II.*	Sh.	In.	20 2	I.	Tr.	Eg.	
8 51	I.*	Tr.	Eg.	10 42	II.*	Tr.	Eg.	21 17	I.	Sh.	Eg.	
10 0	III.*	Oc.	Re.	13 10	II.	Sh.	Eg.	23 14 54	I.	Oc.	Dis.	
10 1	I.*	Sh.	Eg.	21 25	I.	Tr.	In.	18 22 51	I.	Ec.	Re.	
12 21 34	III.*	Ec.	Dis.	22 39	I.	Sh.	In.	23 48	II.	Tr.	In.	
14 30 31	III.	Ec.	Re.	23 40	I.	Tr.	Eg.	24 2 22	II.	Sh.	In.	
4 3 44	I.	Oc.	Dis.	14 0 54	I.	Sh.	Eg.	2 32	II.	Tr.	Eg.	
7 7 4	I.	Ec.	Re.	1 6	III.	Tr.	In.	5 3	II.	Sh.	Eg.	
11 19	II.*	Oc.	Dis.	3 44	III.	Tr.	Eg.	12 15	I.	Tr.	In.	
16 22 19	II.	Ec.	Re.	6 16	III.	Sh.	In.	13 32	I.	Sh.	In.	
5 1 4	I.	Tr.	In.	8 36	III.*	Sh.	Eg.	14 31	I.	Tr.	Eg.	
2 15	I.	Sh.	In.	18 32	I.	Oc.	Dis.	15 46	I.	Sh.	Eg.	
3 19	I.	Tr.	Eg.	21 59 17	I.	Ec.	Re.	18 55	III.	Oc.	Dis.	
4 30	I.	Sh.	Eg.	15 3 7	II.	Oc.	Dis.	21 35	III.	Oc.	Re.	
22 12	I.	Oc.	Dis.	8 16 46	II.*	Ec.	Re.	25 0 20 14	III.	Ec.	Dis.	
6 1 35 43	I.	Ec.	Re.	15 53	I.	Tr.	In.	2 25 20	III.	Ec.	Re.	
5 29	II.	Tr.	In.	17 8	I.	Sh.	In.	9 23	I.*	Oc.	Dis.	
7 53	II.*	Sh.	In.	18 8	I.	Tr.	Eg.	12 51 36	I.	Ec.	Re.	
8 12	II.*	Tr.	Eg.	19 22	I.	Sh.	Eg.	18 58	II.	Oc.	Dis.	
10 34	II.*	Sh.	Eg.	16 13 1	I.	Oc.	Dis.	26 0 10 25	II.	Ec.	Re.	
19 32	I.	Tr.	In.	16 27 58	I.	Ec.	Re.	6 44	I.	Tr.	In.	
20 44	I.	Sh.	In.	21 15	II.	Tr.	In.	8 0	I.*	Sh.	In.	
21 18	III.	Tr.	In.	23 46	II.	Sh.	In.	8 59	I.*	Tr.	Eg.	
21 47	I.	Tr.	Eg.	23 58	II.	Tr.	Eg.	10 15	I.*	Sh.	Eg.	
22 59	I.	Sh.	Eg.	17 2 27	II.	Sh.	Eg.	27 3 52	I.	Oc.	Dis.	
23 54	III.	Tr.	Eg.	10 21	I.*	Tr.	In.	7 20 17	I.	Ec.	Re.	
7 2 17	III.	Sh.	In.	11 37	I.*	Sh.	In.	13 6	II.	Tr.	In.	
4 38	III.	Sh.	Eg.	12 36	I.	Tr.	Eg.	15 40	II.	Sh.	In.	
16 40	I.	Oc.	Dis.	13 51	I.	Sh.	Eg.	15 50	II.	Tr.	Eg.	
20 4 28	I.	Ec.	Re.	15 0	III.	Oc.	Dis.	18 21	II.	Sh.	Eg.	
8 0 35	II.	Oc.	Dis.	17 39	III.	Oc.	Re.	28 1 13	I.	Tr.	In.	
5 40 41	II.	Ec.	Re.	20 20 55	III.	Ec.	Dis.	2 29	I.	Sh.	In.	
14 0	I.	Tr.	In.	22 27 18	III.	Ec.	Re.	3 28	I.	Tr.	Eg.	
15 13	I.	Sh.	In.	18 7 29	I.	Oc.	Dis.	4 43	I.	Sh.	Eg.	
16 15	I.	Tr.	Eg.	10 56 42	I.*	Ec.	Re.	8 56	III.*	Tr.	In.	
17 27	I.	Sh.	Eg.	16 23	II.	Oc.	Dis.	11 37	III.	Tr.	Eg.	
9 11 8	I.*	Oc.	Dis.	21 34 32	II.	Ec.	Re.	14 15	III.	Sh.	In.	
14 33 8	I.	Ec.	Re.	19 4 50	I.	Tr.	In.	16 33	III.	Sh.	Eg.	
18 44	II.	Tr.	In.	6 5	I.	Sh.	In.	22 21	I.	Oc.	Dis.	
21 11	II.	Sh.	In.	7 5	I.	Tr.	Eg.	29 1 49 4	I.	Ec.	Re.	
21 27	II.	Tr.	Eg.	8 20	I.*	Sh.	Eg.	8 16	II.*	Oc.	Dis.	
23 52	II.	Sh.	Eg.	20 1 58	I.	Oc.	Dis.	13 28 29	II.	Ec.	Re.	
10 8 28	I.*	Tr.	In.	5 25 23	I.	Ec.	Re.	19 41	I.	Tr.	In.	
9 42	I.*	Sh.	In.	10 31	II.*	Tr.	In.	20 58	I.	Sh.	In.	
10 43	I.*	Tr.	Eg.	13 4	II.	Sh.	In.	21 57	I.	Tr.	Eg.	
11 10	III.*	Oc.	Dis.	13 15	II.	Tr.	Eg.	23 12	I.	Sh.	Eg.	
11 56	I.*	Sh.	Eg.	15 45	II.	Sh.	Eg.	30 16 49	I.	Oc.	Dis.	
13 47	III.	Oc.	Re.	23 18	I.	Tr.	In.	20 17 46	I.	Ec.	Re.	

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

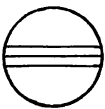
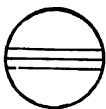
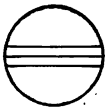
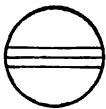
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

[Eph 10]

WASHINGTON MEAN TIME.

JUNE.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I.		r *	III.		d *      r *
II.		r *	IV. No Eclipse.		

*Configurations at 10<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1		3'			○ 1'	'2		'4
2			3		○	2'		'4 '1 ●
3		2'		1' ○	3			'4
4			'2	○	'1	'3		4'
5			1'	○		2'	3'	4'
6				2' ○	1' 3		4'	
7			'2 3' 1	○	4'			
8		3'		4' ○	1' '2			
9		4' '3		'1 ○	2'			
10	○ 1'	4'		2' '3	○			
11	4'			'2 ○	'1	'3		
12	'4			1' ○		'2	3'	
13	○ 2'	'4			○	'1 3'		
14		'4		'2 '1 3'	○			
15		3'	'4		○	2' 1'		
16		'3		'1 ○	4	2'		
17			2' '3	○ 1'		'4		
18			'2	○	'3		'4 '1 ●	
19			1'	○	'2	'3	'4	
20				○ 2'	'1 3'		'4	
21			'2 1' 3'	○			4'	
22		3'		○	1'		4' '2 ●	
23		'3		'1 ○		2' 4'		
24			3' 2'	○ 1' 4				
25			4' 2'	○	'3		'1 ●	
26		4'		1' ○	'2	'3		
27	4'			○	2' '1	3'		
28	○ 3' 4'		2' 1'	○				
29	'4		3'	○	'1		'2 ●	
30	'4	'3	'1	○	2'			

## WASHINGTON MEAN TIME.

**JULY.**

d	h	m	s
1	2	24	
	4	58	
	5	8	
	7	39	
	14	10	
	15	27	
	16	26	
	17	41	
	22	54	
2	1	35	
	4	19 37	
	6	23 25	
	11	18	
	14	46 32	
	21	34	
3	2	46 9	
	8	39	
	9	55	
	10	54	
	12	10	
4	5	47	
	9	15 14	
	15	43	
	18	17	
	18	27	
	20	57	
5	3	8	
	4	24	
	5	23	
	6	38	
	12	57	
	15	38	
	18	15	
	20	32	
6	0	16	
	3	44 1	
	10	53	
	16	4 6	
	21	37	
	22	53	
	23	52	
7	1	7	
	18	45	
	22	12 44	
8	5	2	
	7	35	
	7	46	
	10	15	
	16	6	
	17	22	
	18	21	
	19	36	
9	2	57	
	5	38	
	8	19 8	
	10	21 40	
	13	14	
	16	41 30	
10	0	12	
	5	21 44	
	10	35	
	11	50	
	12	50	
	14	4	
11	7	43	
	11	10 11	

II.

Tr.

In.

II.

Sh.

In.

II.

Tr.

Eg.

II.

Sh.

Eg.

I.

Tr.

In.

I.

Sh.

In.

I.

Tr.

Eg.

III.

Oc.

Dis.

III.

Oc.

Re.

III.

Ec.

Dis.

III.

Ec.

Re.

I.

Oc.

Dis.

I.

Ec.

Re.

II.

Oc.

Re.

I.\*

Tr.

In.

I.\*

Sh.

In.

I.\*

Tr.

Eg.

I.

Sh.

Eg.

I.

Oc.

Dis.

I.\*

Ec.

Re.

II.

Tr.

In.

II.

Sh.

In.

II.

Tr.

Eg.

II.

Sh.

Eg.

I.

Tr.

In.

I.

Sh.

In.

I.

Sh.

**NOTE.**—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

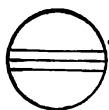
[Eph 10]

WASHINGTON MEAN TIME.

JULY.

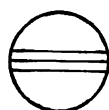
*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I.



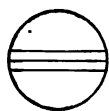
r  
\*

III.



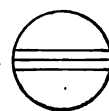
d r  
\* \*

II.



r  
\*

IV. No Eclipse.



*Configurations at 9<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1		'4	'3	2'	○	1'		
2			'2 '4	'1	○	'3		
3	○ 1'				○	'4 '2	'3	
4					○	2'	'4 '3	'1 ●
5			2'	1'	○	3'		'4
6			3'	'2	○	'1		'4
7		3'	1'		○	'2		'4
8			'3	2'	○	1'		'4
9			'2	'1	○		4'	'3 ●
10					○	1' '2	4' '3	
11					○	2'	3'	'1 ●
12			4' 2'	1'	○	3'		
13		4'	3'	'2	○	'1		
14	4'	3'	1'		○	'2		
15	○ 2' 4'		'3		○	1'		
16	'4		'2	'1	○			'3 ●
17		'4			○	'2	'3	
18			'4	'1	○	2' 3'		
19	○ 1'		2' '4		○	3'		
20			3' 2'		○	'1 '4		
21		3'	1'		○	'2	'4	
22		'3			○	2' '1		'4
23			2' '1	'3	○			'4
24					○	1'	'3	4' '2 ●
25			'1		○	2' 3'	4'	
26	○ 1'		2' 3'		○	3'	4'	
27			'2	'3	○	4'		'1 ●
28		3'	1'	'4	○	'2		
29		'3 4'			○	2' '1		
30		4'	2' 1' '3		○			
31	4'				○	'1 '3		'2 ●

## WASHINGTON MEAN TIME.

## AUGUST.

d	h	m	s				d	h	m	s				d	h	m	s			
1	13	37		I.	Oc.	Dis.	11	8	27		I.*	Sh.	In.	21	16	27		II.	Oc.	Dis.
	16	55	7	I.	Ec.	Re.		9	41		I.	Tr.	Eg.		20	51	27	I.	Ec.	Re.
2	2	27		II.	Tr.	In.		10	40		I.	Sh.	Eg.		22	25		I.	Tr.	In.
	4	43		II.	Sh.	In.	12	4	36		I.	Oc.	Dis.		23	18		I.	Sh.	In.
	5	12		II.	Tr.	Eg.		7	47	34	I.*	Ec.	Re.	22	0	40		I.	Tr.	Eg.
	7	23		II.	Sh.	Eg.		18	35		II.	Tr.	In.		1	32		I.	Sh.	Eg.
	10	57		I.	Tr.	In.		20	37		II.	Sh.	In.		19	35		I.	Oc.	Dis.
	12	3		I.	Sh.	In.		21	19		II.	Tr.	Eg.		22	39	54	I.	Ec.	Re.
	13	13		I.	Tr.	Eg.		23	17		II.	Sh.	Eg.	23	10	46		II.	Tr.	In.
	14	17		I.	Sh.	Eg.	13	1	55		I.	Tr.	In.		12	33		II.	Sh.	In.
3	5	34		III.	Tr.	In.		2	55		I.	Sh.	In.		13	30		II.	Tr.	Eg.
	8	6		I.*	Oc.	Dis.		4	11		I.	Tr.	Eg.		15	13		II.	Sh.	Eg.
	8	14		III.*	Tr.	Eg.		5	9		I.	Sh.	Eg.		16	55		I.	Tr.	In.
	10	12		III.	Sh.	In.		23	5		I.	Oc.	Dis.		17	47		I.	Sh.	In.
	11	23	55	I.	Ec.	Re.	14	0	0		III.	Oc.	Dis.		19	10		I.	Tr.	Eg.
	12	24		III.	Sh.	Eg.		2	16	20	I.	Ec.	Re.		20	1		I.	Sh.	Eg.
	21	37		II.	Oc.	Dis.		2	38		III.	Oc.	Re.	24	14	6		I.	Oc.	Dis.
4	2	24	52	II.	Ec.	Re.		4	17	48	III.	Ec.	Dis.		17	8	40	I.	Ec.	Re.
	5	27		I.	Tr.	In.		6	13	56	III.	Ec.	Re.		18	31		III.	Tr.	In.
	6	32		I.	Sh.	In.		13	42		II.	Oc.	Dis.		21	7		III.	Tr.	Eg.
	7	42		I.*	Tr.	Eg.		18	16	56	II.	Ec.	Re.		22	10		III.	Sh.	In.
	8	46		I.*	Sh.	Eg.		20	25		I.	Tr.	In.	25	0	19		III.	Sh.	Eg.
5	2	36		I.	Oc.	Dis.		21	24		I.	Sh.	In.		5	50		II.	Oc.	Dis.
	5	52	37	I.	Ec.	Re.		22	41		I.	Tr.	Eg.		10	8	38	II.	Ec.	Re.
	15	49		II.	Tr.	In.		23	38		I.	Sh.	Eg.		11	25		I.	Tr.	In.
	18	1		II.	Sh.	In.	15	17	35		I.	Oc.	Dis.		12	16		I.	Sh.	In.
	18	33		II.	Tr.	Eg.		20	45	0	I.	Ec.	Re.		13	40		I.	Tr.	Eg.
	20	41		II.	Sh.	Eg.	16	7	53		II.*	Tr.	In.		14	29		I.	Sh.	Eg.
	23	56		I.	Tr.	In.		9	56		II.	Sh.	In.	26	8	36		I.	Oc.	Dis.
6	1	1		I.	Sh.	In.		10	42		II.	Tr.	Eg.		11	37	21	I.	Ec.	Re.
	2	12		I.	Tr.	Eg.		12	36		II.	Sh.	Eg.	27	0	9		II.	Tr.	In.
	3	14		I.	Sh.	Eg.		14	55		I.	Tr.	In.		1	51		II.	Sh.	In.
	19	42		III.	Oc.	Dis.		15	53		I.	Sh.	In.		2	53		II.	Tr.	Eg.
	21	6		I.	Oc.	Dis.		17	10		I.	Tr.	Eg.		4	31		II.	Sh.	Eg.
	22	22		III.	Oc.	Re.		18	6		I.	Sh.	Eg.		5	55		I.	Tr.	In.
7	0	18	31	III.	Ec.	Dis.	17	12	5		I.	Oc.	Dis.		6	44		I.	Sh.	In.
	0	21	24	I.	Ec.	Re.		14	10		III.	Tr.	In.		8	10		I.	Tr.	Eg.
	2	15	55	III.	Ec.	Re.		15	13	47	I.	Ec.	Re.		8	58		I.	Sh.	Eg.
	10	58		II.	Oc.	Dis.		16	48		III.	Tr.	Eg.	28	3	6		I.	Oc.	Dis.
	15	42	15	II.	Ec.	Re.		18	11		III.	Sh.	In.		6	6	6	I.	Ec.	Re.
	18	26		I.	Tr.	In.		20	21		III.	Sh.	Eg.		8	42		III.	Oc.	Dis.
	19	29		I.	Sh.	In.	18	3	5		II.	Oc.	Dis.		11	17		III.	Oc.	Re.
	20	42		I.	Tr.	Eg.		7	34	13	II.*	Ec.	Re.		12	16	30	III.	Ec.	Dis.
	21	43		I.	Sh.	Eg.		9	25		I.	Tr.	In.		14	10	7	III.	Ec.	Re.
8	15	36		I.	Oc.	Dis.		10	21		I.	Sh.	In.		19	13		II.	Oc.	Dis.
	18	50	4	I.	Ec.	Re.		11	40		I.	Tr.	Eg.		23	25	47	II.	Ec.	Re.
9	5	12		II.	Tr.	In.		12	35		I.	Sh.	Eg.	29	0	25		I.	Tr.	In.
	7	19		II.	Sh.	In.		19	6	35	I.	Oc.	Dis.		1	13		I.	Sh.	In.
	7	56		II.*	Tr.	Eg.		9	42	29	I.	Ec.	Re.		2	40		I.	Tr.	Eg.
	9	59		II.	Sh.	Eg.		21	22		II.	Tr.	In.		3	26		I.	Sh.	Eg.
	12	56		I.	Tr.	In.		23	14		II.	Sh.	In.		21	36		I.	Oc.	Dis.
	13	58		I.	Sh.	In.	20	0	6		II.	Tr.	Eg.	30	0	34	45	I.	Ec.	Re.
	15	11		I.	Tr.	Eg.		1	54		II.	Sh.	Eg.		13	34		II.	Tr.	In.
	16	12		I.	Sh.	Eg.		3	55		I.	Tr.	In.		15	10		II.	Sh.	In.
10	9	51		III.	Tr.	In.		4	50		I.	Sh.	In.		16	18		II.	Tr.	Eg.
	10	6		I.	Oc.	Dis.		6	10		I.	Tr.	Eg.		17	50		II.	Sh.	Eg.
	12	30		III.	Tr.	Eg.		7	3		I.	Sh.	Eg.		18	55		I.	Tr.	In.
	13	18	52	I.	Ec.	Re.	21	1	5		I.	Oc.	Dis.		19	42		I.	Sh.	In.
	14	11		III.	Sh.	In.		4	11	15	I.	Ec.	Re.		21	10		I.	Tr.	Eg.
	16	23		III.	Sh.	Eg.		4	20		III.	Oc.	Dis.		21	55		I.	Sh.	Eg.
11	0	20		II.	Oc.	Dis.		6	57		III.	Oc.	Re.	31	16	6		I.	Oc.	Dis.
	4	59	38	II.	Ec.	Re.		8	17	7	III.	Ec.	Dis.		19	3	31	I.	Ec.	Re.
	7	26		I.*	Tr.	In.		10	11	59	III.	Ec.	Re.		22	54		III.	Tr.	In.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

WASHINGTON MEAN TIME.

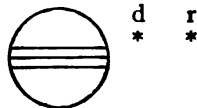
AUGUST.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I.



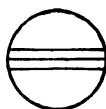
III.



II.



IV. No Eclipse.



*Configurations at 8<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1	4'			'1	○	2'	'3	
2		'4		2'	○	1'	3'	
3	○ 3'	'4		'2	○			
4			'4	1'	○	'2		
5			'3	'4	○	'1 2'		
6			2'	'31'	○	'4		
7				'2	○	'3	'4	
8				'1	○	'2	'3	
9				2'	○	1'	3'	
10			'2	'1	○ 3'		'4	
11	○ 1'		3'		○	'2	'4	
12		'3			○	'1 2'	'4	
13			'32'	1'	○	'4		
14				'2 4'	○	'3	'1	
15			4'	1'	○	'2	'3	
16	○ 2'	4'			○	1'	3'	
17	4'		'2	'1	○	3'		
18	'4		3'		○	1' 4'		
19	'4	3'			○	2'	'1 ●	
20		'4	'3	2' 1'	○			
21			'4	'2	○	'3	'1	
22				1' 4'	○	'2	'3	
23					○	2' 1' 4'	3'	
24			2'	'1	○	3'	'4	
25			3'		○	1'	'4	
26		3'		'1	○	2'	'4	
27	○ 1'	'3		2'	○		'4	
28			2'	'3	○	'1	'4	
29			1'		○	'2	'3	
30					○	2' 4' 1'	3'	
31			2'	'14'	○	3'		

WASHINGTON MEAN TIME.

SEPTEMBER.

d	h	m	s		d	h	m	s		d	h	m	s	
1	1	28		III. Tr. Eg.	6	16	23		II. Tr. In.	11	20	3		III. Oc. Re.
	2	9		III. Sh. In.		17	47		II. Sh. In.		20	15	56	III. Ec. Dis.
	4	17		III. Sh. Eg.		19	7		II. Tr. Eg.		22	7	4	III. Ec. Re.
	8	36		II. Oc. Dis.		20	26		II. Sh. Eg.	12	0	46		II. Oc. Dis.
	12	42	53	II. Ec. Re.		20	55		I. Tr. In.		4	25		I. Tr. In.
	13	25		I. Tr. In.		21	35		I. Sh. In.		4	34	0	II. Ec. Re.
	14	10		I. Sh. In.		23	10		I. Tr. Eg.		5	1		I. Sh. In.
	15	40		I. Tr. Eg.		23	49		I. Sh. Eg.		6	40		I. Tr. Eg.
	16	24		I. Sh. Eg.	7	18	7		I. Oc. Dis.		7	15		I. Sh. Eg.
2	10	36		I. Oc. Dis.		20	58	18	I. Ec. Re.	13	1	38		I. Oc. Dis.
	13	32	11	I. Ec. Re.	8	3	18		III. Tr. In.		4	24	18	I. Ec. Re.
3	2	58		II. Tr. In.		5	50		III. Tr. Eg.		19	13		II. Tr. In.
	4	28		II. Sh. In.		6	8		III. Sh. In.		20	24		II. Sh. In.
	5	42		II. Tr. Eg.		8	14		III. Sh. Eg.		21	56		II. Tr. Eg.
	7	7		II.* Sh. Eg.		11	22		II. Oc. Dis.		22	56		I. Tr. In.
	7	55		I. Tr. In.		15	16	58	II. Ec. Re.		23	3		II. Sh. Eg.
	8	38		I. Sh. In.		15	25		I. Tr. In.		23	30		I. Sh. In.
	10	10		I. Tr. Eg.		16	4		I. Sh. In.	14	1	10		I. Tr. Eg.
	10	52		I. Sh. Eg.		17	40		I. Tr. Eg.		1	43		I. Sh. Eg.
4	5	7		I. Oc. Dis.		18	17		I. Sh. Eg.		20	8		I. Oc. Dis.
	8	0	56	I. Ec. Re.	9	12	37		I. Oc. Dis.		22	53	2	I. Ec. Re.
	13	6		III. Oc. Dis.		15	26	57	I. Ec. Re.	15	7	43		III. Tr. In.
	15	40		III. Oc. Re.	10	5	48		II. Tr. In.		10	6		III. Sh. In.
	16	16	28	III. Ec. Dis.		7	5		II. Sh. In.		10	13		III. Tr. Eg.
	18	8	50	III. Ec. Re.		8	31		II. Tr. Eg.		12	11		III. Sh. Eg.
	21	59		II. Oc. Dis.		9	44		II. Sh. Eg.		14	9		II. Oc. Dis.
5	1	59	58	II. Ec. Re.		9	55		I. Tr. In.		17	26		I. Tr. In.
	2	25		I. Tr. In.		10	32		I. Sh. In.		17	50	54	II. Ec. Re.
	3	7		I. Sh. In.		12	10		I. Tr. Eg.		17	58		I. Sh. In.
	4	40		I. Tr. Eg.		12	46		I. Sh. Eg.		19	41		I. Tr. Eg.
	5	20		I. Sh. Eg.	11	7	8		I. Oc. Dis.		20	12		I. Sh. Eg.
	23	37		I. Oc. Dis.		9	55	41	I. Ec. Re.	16	14	39		I. Oc. Dis.
6	2	29	33	I. Ec. Re.		17	32		III. Oc. Dis.		17	21	40	I. Ec. Re.

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from September 17 to November 15.

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from September 17 to November 15.

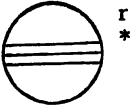
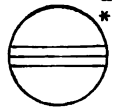
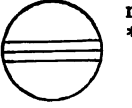
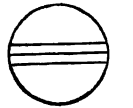
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.  
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.  
[Eph 10]



WASHINGTON MEAN TIME.

SEPTEMBER.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

I.		III.	
II.		IV. No Eclipse.	

*Configurations at 7<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1		4'	3'	'2	○	1'		
2	4'	3'	'1	○		'2		
3	4'	'3		2'	○	1'		
4	'4	'2	'3	○			'1	●
5	'4		1'	○	'2	'3		
6		'4		○	'1	2'	'3	
7		'42'	1'	○		3'		
8			'2	3'	○	1'		
9		3'	'1	○		'4		
10	○ 2'	'3		○	1'		'4	
11		'2	'3	'1	○		'4	
12			1'	○	'2	'3		'4
13				○	'1	2'	'3	4'
14		2'	1'	○		3'		4'
15		'2		○	3'	'1	4'	
16		3'	'1	○	4'	'2		
17				○				
18				○				
19				○				
20				○				
21				○				
22				○				
23				○				
24				○				
25				○				
26				○				
27				○				
28				○				
29				○				
30				○				

## WASHINGTON MEAN TIME.

## NOVEMBER.

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from September 17 to November 15.

d h m s	I.	Sh.	In.	d h m s	I.	Oc.	Re.	d h m s	III.	Tr.	In.
16 16 34	I.	Sh.	In.	21 5 34	I.	Sh.	In.	26 4 20	III.	Tr.	Eg.
17 2	I.	Tr.	In.	23 59	I.	Sh.	In.	6 19	III.	Tr.	Eg.
18 47	I.	Sh.	Eg.	22 0 32	I.	Tr.	In.	10 15 38	I.	Ec.	Dis.
19 16	I.	Tr.	Eg.	2 12	I.	Sh.	Eg.	13 4	I.	Oc.	Re.
19 52	II.	Sh.	In.	2 46	I.	Tr.	Eg.	27 7 24	I.	Sh.	In.
20 51	II.	Tr.	In.	3 36 2	II.	Ec.	Dis.	8 2	I.	Tr.	In.
22 31	II.	Sh.	Eg.	7 20	II.	Oc.	Re.	9 37	I.	Sh.	Eg.
23 31	II.	Tr.	Eg.	12 5 8	III.	Ec.	Dis.	10 15	I.	Tr.	Eg.
17 13 53 17	I.	Ec.	Dis.	13 44 35	III.	Ec.	Re.	11 46	II.	Sh.	In.
16 34	I.	Oc.	Re.	14 13	III.	Oc.	Dis.	13 4	II.	Tr.	In.
18 11 2	I.	Sh.	In.	16 14	III.	Oc.	Re.	14 24	II.	Sh.	Eg.
11 32	I.	Tr.	In.	21 18 41	I.	Ec.	Dis.	15 43	II.	Tr.	Eg.
13 15	I.	Sh.	Eg.	23 0 4	I.	Oc.	Re.	28 4 44 10	I.	Ec.	Dis.
13 46	I.	Tr.	Eg.	18 27	I.	Sh.	In.	7 34	I.	Oc.	Re.
14 19 24	II.	Ec.	Dis.	19 2	I.	Tr.	In.	29 1 52	I.	Sh.	In.
17 57	II.*	Oc.	Re.	20 40	I.	Sh.	Eg.	2 32	I.	Tr.	In.
21 52	III.	Sh.	In.	21 16	I.	Tr.	Eg.	4 5	I.	Sh.	Eg.
23 48	III.	Sh.	Eg.	22 28	II.	Sh.	In.	4 45	I.	Tr.	Eg.
23 54	III.	Tr.	In.	23 40	II.	Tr.	In.	6 9 20	II.	Ec.	Dis.
19 1 57	III.	Tr.	Eg.	24 1 6	II.	Sh.	Eg.	10 5	II.	Oc.	Re.
8 21 44	I.	Ec.	Dis.	2 20	II.	Tr.	Eg.	16 3 19	III.	Ec.	Dis.
11 4	I.	Oc.	Re.	15 47 13	I.	Ec.	Dis.	17 41 41	III.*	Ec.	Re.
20 5 30	I.	Sh.	In.	18 34	I.	Oc.	Re.	18 39	III.	Oc.	Dis.
6 2	I.	Tr.	In.	25 12 55	I.	Sh.	In.	20 36	III.	Oc.	Re.
7 43	I.	Sh.	Eg.	13 32	I.	Tr.	In.	23 12 33	I.	Ec.	Dis.
8 16	I.	Tr.	Eg.	15 8	I.	Sh.	Eg.	30 2 4	I.	Oc.	Re.
9 10	II.	Sh.	In.	15 45	I.	Tr.	Eg.	20 20	I.	Sh.	In.
10 15	II.	Tr.	In.	16 52 42	II.*	Ec.	Dis.	21 2	I.	Tr.	In.
11 48	II.	Sh.	Eg.	20 43	II.	Oc.	Re.	22 33	I.	Sh.	Eg.
12 55	II.	Tr.	Eg.	26 1 50	III.	Sh.	In.	23 15	I.	Tr.	Eg.
21 2 50 17	I.	Ec.	Dis.	3 45	III.	Sh.	Eg.				

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

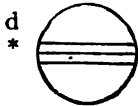
[Eph 10]

WASHINGTON MEAN TIME.

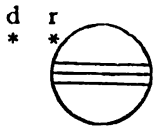
NOVEMBER.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*

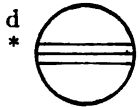
I.



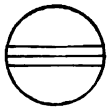
III.



II.



IV. No Eclipse.



*Configurations at 17<sup>h</sup> 30<sup>m</sup> for an Inverting Telescope.*

Day.

West.

East.

1		○	
2		○	
3		○	
4		○	
5		○	
6		○	
7		○	
8		○	
9		○	
10		○	
11		○	
12		○	
13		○	
14		○	
15		○	
16	○ 1'	○ 2'	'3 '4
17		○ '1	3' '4
18		○ 3'	'1 2' '4 2 ●
19		○ '1 2'	4'
20	3'	○ '3 '2	4'
21	'3 '2	○ '1	4'
22	'1	○ 3 4' '2	
23	4'	○ '1 2'	'3
24	4' 2'	○	3' '1 ●
25	4' '1	○ 3'	'2 ●
26	4' 3'	○ '1 2'	
27	'4 3' '1 2'	○	
28	'4 '3 '2	○ '1	
29	'4 '1	○ '2	'3 ●
30	4'	○ '1 2' '3	

## WASHINGTON MEAN TIME.

## DECEMBER.

d	h	m	s		d	h	m	s		d	h	m	s		d	h	m	s		
1	1	4		II.	11	13	23		I.	22	2	0		I.	22	2	0		I.	
	2	29		II.		14	14		I.		2	58		I.		2	58		I.	
	3	42		II.		16	57		II.*		4	13		I.		4	13		I.	
	5	8		II.		18	39		II.*		5	11		I.		5	11		I.	
	17	41	2	I.*		19	35		II.		8	50		II.		8	50		II.	
	20	34		I.		21	18		II.		10	49		II.		10	49		II.	
2	14	49		I.	12	8	31	37	I.		11	28		II.		11	28		II.	
	15	32		I.		11	33		I.		13	26		II.		13	26		II.	
	17	2		I.*	13	5	39		I.		23	21	57	I.		23	21	57	I.	
	17	45		I.*		6	30		I.		23	2	31	I.		23	2	31	I.	
	19	25	59	II.		7	51		I.		20	28		I.		20	28		I.	
	23	28		II.		8	43		I.		21	28		I.		21	28		I.	
3	5	49		III.		11	15	58	II.		22	41		I.		22	41		I.	
	7	42		III.		15	34		II.		23	40		I.		23	40		I.	
	8	45		III.	14	0	0	14	III.		24	3	6	I	II.		24	3	6	I
	10	40		III.		1	36	30	III.		7	40		II.		7	40		II.	
	12	9	26	I.		2	59	58	I.		17	41		III.*		17	41		III.*	
	15	4		I.		3	26		III.		17	50	17	I.*		17	50	17	I.*	
4	9	17		I.		5	15		III.		19	32		III.		19	32		III.	
	10	2		I.		6	3		I.		21	0		I.		21	0		I.	
	11	30		I.	15	0	7		I.		21	47		III.		21	47		III.	
	12	15		I.		1	0		I.		23	31		III.		23	31		III.	
	14	21		II.		2	20		I.		25	14	57	I.		25	14	57	I.	
	15	52		II.		3	13		I.		15	57		I.*		15	57		I.*	
	16	59		II.*		6	15		II.		17	9		I.*		17	9		I.*	
	18	31		II.*		8	3		II.		18	10		I.*		18	10		I.*	
5	6	37	56	I.		8	53		II.		22	7		II.		22	7		II.	
	9	34		I.		10	41		II.		26	0	10	II.		26	0	10	II.	
6	3	45		I.		21	28	24	I.		0	45		II.		0	45		II.	
	4	31		I.	16	0	33		I.		2	48		II.		2	48		II.	
	5	58		I.		18	35		I.*		12	18	42	I.		12	18	42	I.	
	6	44		I.		19	30		I.		15	30		I.*		15	30		I.*	
	8	42	38	II.		20	48		I.		27	9	25	I.		27	9	25	I.	
	12	50		II.		21	42		I.		10	27		I.		10	27		I.	
	20	1	31	III.	17	0	32	37	II.		11	38		I.		11	38		I.	
	21	38	49	III.		4	57		II.		12	39		I.		12	39		I.	
	23	3		III.		13	44		III.		16	22	47	II.*		16	22	47	II.*	
7	0	56		III.		15	35		III.		21	0		II.		21	0		II.	
	1	6	18	I.		15	56	45	I.*		28	6	47	I.		28	6	47	I.	
	4	4		I.		17	29		III.*		7	56	42	III.		7	56	42	III.	
	22	14		I.		19	2		I.		9	30	58	III.		9	30	58	III.	
	23	1		I.		19	16		III.		9	59		I.		9	59		I.	
8	0	27		I.	18	13	4		I.		12	5		III.		12	5		III.	
	1	14		I.		13	59		I.		13	46		III.		13	46		III.	
	3	40		II.		15	16		I.		3	53		I.		3	53		I.	
	5	16		II.		16	12		I.*		4	56		I.		4	56		I.	
	6	18		II.		19	32		II.		6	6		I.		6	6		I.	
	7	55		II.		21	26		II.		7	8		I.		7	8		I.	
	19	34	46	I.		22	10		II.		11	25		II.		11	25		II.	
	22	34		I.	19	0	3		II.		13	33		II.		13	33		II.	
9	16	42		I.*		10	25	12	I.		14	3		II.		14	3		II.	
	17	31		I.*		13	32		I.		16	10		II.*		16	10		II.*	
	18	55		I.	20	7	32		I.		30	1	15	24	I.		30	1	15	24
	19	44		I.		8	29		I.		4	29		I.		4	29		I.	
	21	59	17	II.		9	45		I.		22	22		I.		22	22		I.	
10	2	12		II.		10	41		I.		23	25		I.		23	25		I.	
	9	46		III.		13	49	21	II.		31	0	34	I.		31	0	34	I.	
	11	39		III.		18	19		II.*		1	38		I.		1	38		I.	
	13	8		III.	21	3	58	24	III.		5	39	27	II.		5	39	27	II.	
	14	3	9	I.		4	53	32	I.		10	21		II.		10	21		II.	
	14	59		III.		5	33	39	III.		19	43	43	I.		19	43	43	I.	
	17	4		I.*		7	46		III.		21	39		III.		21	39		III.	
11	11	10		I.		8	1		I.		22	58		I.		22	58		I.	
	12	1		I.		9	32		III.		23	29		III.		23	29		III.	

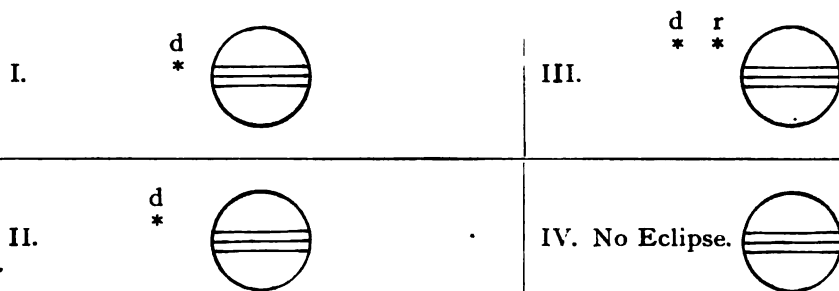
NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.

Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; \* Visible at Washington.

WASHINGTON MEAN TIME.

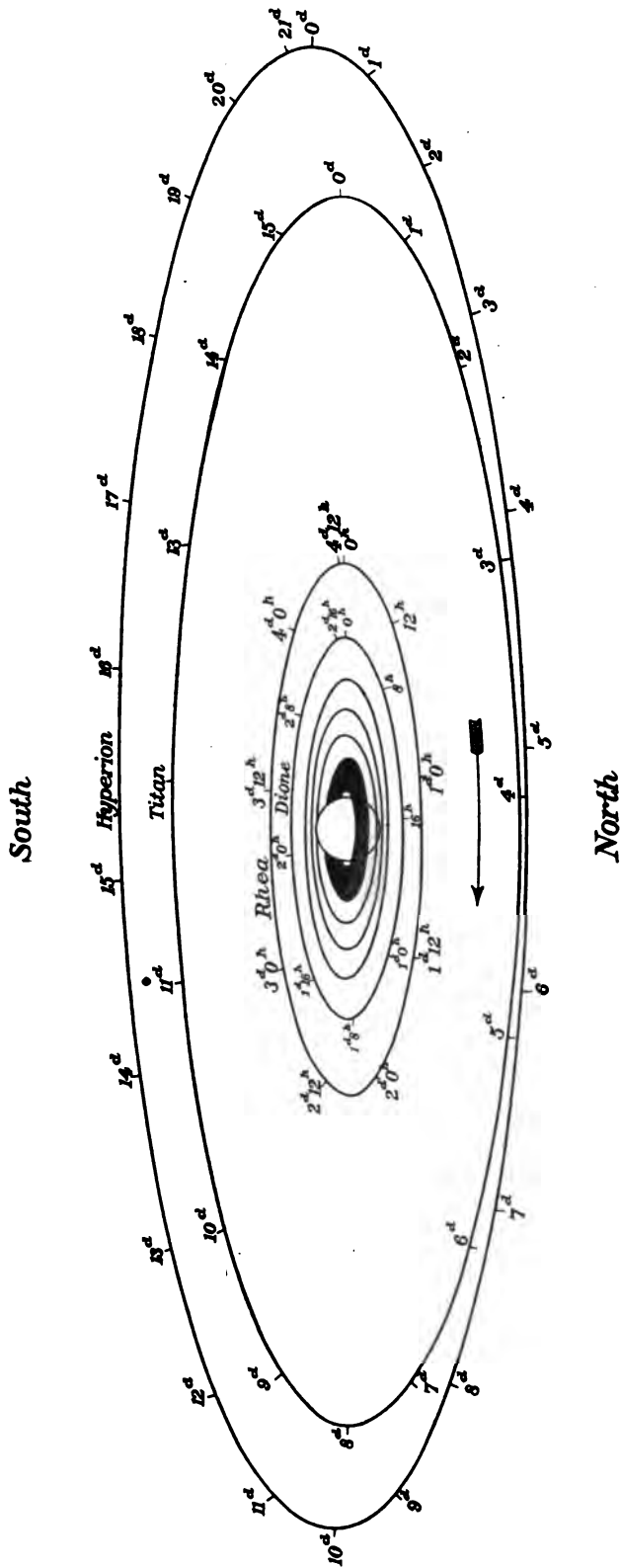
DECEMBER.

*Phases of the Eclipses of the Satellites for an Inverting Telescope.*



*Configurations at 17<sup>h</sup> 0<sup>m</sup> for an Inverting Telescope.*

Day.	West.				East.			
1		2'	'1	○	'4		3'	
2	○	'1		○		3'	'4	
3			3'	○	'1	'2		'4
4	○	2'		○				'4
5		'3	'2	○	'1			'4
6			'1	○	'2			4'
7				○	'1	2'	3'	4'
8			2'	○	'1		4'	'3
9			'2	○	'1	4'	3'	
10			4'	○	3'	'2		'1 ●
11		4'	3'	○	2'			
12	4'		'3	○	'2	'1		
13	4'		'1	○	'2			
14	'4			○	'1	3'	2'	
15	'4	'4	2'	○	'1		3'	
16		'4	'2	○	'1		3'	
17			'4	○	3'	'2		'1 ●
18		3'	'1	○	4'	'2		
19		'3	2'	○	'1		4'	
20			'3	○			4'	'2 ●
21			'1	○	3'	'1	2'	'4
22			'1	○			3'	4'
23			'2	○	'1		3'	4'
24			'1	○	3'	'2		4'
25	○	'1		○	2'		4'	
26		3'	2'	○	'1			
27			'3	○				'2 ●
28		4'		○	3'	'1	'2	
29		4'	'1	○			3'	
30	4'		'2	○	'1		3'	
31	'4		'1	○	3'			



NAMES OF THE SATELLITES.

I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Iapetus.

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,  
AT DATE OF OPPOSITION, OCTOBER 26, 1910,  
AS SEEN IN AN INVERTING TELESCOPE.

MEAN SYNODIC PERIODS.

	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.6
VIII.	79	22.1

## WASHINGTON MEAN TIME OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "o" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner Satellites may be regarded as circular, and the time of any elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. Mimas can be seen only within a few hours of each elongation, and the time of every elongation visible at Washington is given. For the three outer Satellites the eccentricity is taken into account, and the times both of the elongations and of the conjunctions are given. The following abbreviations are used in the tables:

E., East Elongation.  
W., West Elongation.

I., Inferior Conjunction (north of planet).  
S., Superior Conjunction (south of planet).

## MIMAS.

*Greatest Elongations Visible at Washington.*

Jan. 2 11.7 E.	Aug. 20 11.5 E.	Sept. 23 9.6 E.	Oct. 18 9.0 W.	Nov. 9 12.3 E.	Dec. 3 13.0 W.
3 10.3 E.	25 15.9 W.	26 16.9 W.	19 7.6 W.	10 10.9 E.	4 11.6 W.
4 8.9 E.	26 14.6 W.	27 15.5 W.	20 17.4 E.	11 9.5 E.	5 10.3 W.
5 7.6 E.	27 13.2 W.	28 14.1 W.	21 16.0 E.	12 8.1 E.	6 8.9 W.
6 6.2 E.	28 11.8 W.	29 12.7 W.	22 14.6 E.	13 6.7 E.	7 7.5 W.
11 10.5 W.	29 10.4 W.	30 11.3 W.	23 13.2 E.	15 15.4 W.	8 6.1 W.
12 9.2 W.	Sept. 2 16.1 E.	Oct. 1 9.9 W.	24 11.8 E.	16 14.0 W.	11 13.2 E.
13 7.8 W.	3 14.7 E.	2 8.5 W.	25 10.4 E.	17 12.6 W.	12 11.8 E.
14 6.4 W.	4 13.3 E.	4 16.9 E.	26 9.0 E.	18 11.2 W.	13 10.5 E.
20 9.5 E.	5 11.9 E.	5 15.5 E.	27 7.6 E.	19 9.8 W.	14 9.1 E.
July 26 12.2 W.	6 10.5 E.	6 14.2 E.	28 6.3 E.	20 8.4 W.	15 7.7 E.
Aug. 1 15.1 E.	10 16.4 W.	7 12.8 E.	29 16.3 W.	21 7.1 W.	16 6.3 E.
2 13.8 E.	11 15.1 W.	8 11.4 E.	30 14.9 W.	22 5.7 W.	19 13.5 W.
3 12.4 E.	12 13.7 W.	9 10.0 E.	31 13.5 W.	23 15.5 E.	20 12.1 W.
9 15.4 W.	13 12.3 W.	10 8.6 E.	Nov. 1 12.2 W.	24 14.1 E.	21 10.7 W.
10 14.1 W.	14 10.9 W.	11 7.2 E.	2 10.8 W.	25 12.7 E.	22 9.4 W.
11 12.7 W.	15 9.5 W.	12 17.3 W.	3 9.4 W.	26 11.3 E.	23 8.0 W.
12 11.3 W.	18 16.5 E.	13 15.9 W.	4 8.0 W.	27 10.0 E.	24 6.6 W.
17 15.6 E.	19 15.1 E.	14 14.5 W.	5 6.6 W.	28 8.6 E.	28 12.4 E.
18 14.2 E.	20 13.7 E.	15 13.1 W.	6 16.4 E.	29 7.2 E.	29 11.0 E.
19 12.8 E.	21 12.4 E.	16 11.7 W.	7 15.0 E.	30 5.8 E.	30 9.6 E.
	22 11.0 E.	17 10.3 W.	8 13.6 E.	Dec. 2 14.4 W.	31 8.2 E.

## ENCELADUS.

Jan. 1 21.4 E.	Jan. 15 14.3 E.	July 8 16.4 E.	July 21 0.4 E.	Aug. 3 17.3 E.	Aug. 17 10.1 E.
3 6.3 E.	16 23.2 E.	10 1.3 E.	22 9.3 E.	5 2.1 E.	18 19.0 E.
4 15.2 E.	18 8.1 E.	11 10.2 E.	23 18.2 E.	6 11.0 E.	20 3.9 E.
6 0.1 E.	19 17.0 E.	12 19.1 E.	25 3.1 E.	7 19.9 E.	21 12.7 E.
7 9.0 E.	21 1.9 E.	14 4.0 E.	26 11.9 E.	9 4.8 E.	22 21.6 E.
8 17.9 E.	22 10.8 E.	15 12.8 E.	27 20.8 E.	10 13.7 E.	24 6.5 E.
10 2.8 E.	23 19.7 E.	16 21.7 E.	29 5.7 E.	11 22.6 E.	25 15.4 E.
11 11.7 E.	25 4.6 E.	18 6.6 E.	30 14.6 E.	13 7.5 E.	27 0.2 E.
12 20.5 E.	26 13.5 E.	19 15.5 E.	31 23.5 E.	14 16.3 E.	28 9.1 E.
14 5.4 E.	27 22.4 E.		Aug. 2 8.4 E.	16 1.2 E.	29 18.0 E.

## WASHINGTON MEAN TIME OF GREATEST ELONGATION.

## ENCELADUS—(Concluded).

Aug.	d h	Sept.	d h	Oct.	d h	Oct.	d h	Nov.	d h	Dec.	d h
31	2.9 E.	20	16.1 E.	11	5.2 E.	31	18.4 E.	21	7.5 E.	11	20.7 E.
1	11.8 E.	22	1.0 E.	12	14.1 E.	2	3.2 E.	22	16.4 E.	13	5.6 E.
2	20.7 E.	23	9.9 E.	13	23.0 E.	3	12.1 E.	24	1.3 E.	14	14.5 E.
4	5.6 E.	24	18.7 E.	15	7.9 E.	4	21.0 E.	25	10.1 E.	15	23.4 E.
5	14.4 E.	26	3.6 E.	16	16.7 E.	6	5.9 E.	26	19.0 E.	17	8.2 E.
6	23.3 E.	27	12.5 E.	18	1.6 E.	7	14.7 E.	28	3.9 E.	18	17.1 E.
8	8.2 E.	28	21.4 E.	19	10.5 E.	8	23.6 E.	29	12.8 E.	20	2.0 E.
9	17.1 E.	30	6.3 E.	20	19.4 E.	10	8.5 E.	30	21.7 E.	21	10.9 E.
11	2.0 E.	Oct. 1	15.2 E.	22	4.2 E.	11	17.4 E.	Dec. 2	6.5 E.	22	19.8 E.
12	10.8 E.	3	0.0 E.	23	13.1 E.	13	2.2 E.	3	15.4 E.	24	4.7 E.
13	19.7 E.	4	8.9 E.	24	22.0 E.	14	11.1 E.	5	0.3 E.	25	13.6 E.
15	4.6 E.	5	17.7 E.	26	6.9 E.	15	20.0 E.	6	9.2 E.	26	22.5 E.
16	13.5 E.	7	2.6 E.	27	15.7 E.	17	4.9 E.	7	18.1 E.	28	7.4 E.
17	22.3 E.	8	11.5 E.	29	0.6 E.	18	13.8 E.	9	3.0 E.	29	16.2 E.
19	7.2 E.	9	20.4 E.	30	9.5 E.	19	22.6 E.	10	11.8 E.	31	1.1 E.

## TETHYS.

Jan.	d h	July	d h	Aug.	d h	Sept.	d h	Oct.	d h	Nov.	d h
1	7.6 E.	5	10.0 E.	10	7.0 E.	15	3.7 E.	21	0.2 E.	25	20.7 E.
3	4.9 E.	7	7.4 E.	12	4.3 E.	17	1.0 E.	22	21.5 E.	27	18.0 E.
5	2.2 E.	9	4.7 E.	14	1.6 E.	18	22.3 E.	24	18.8 E.	29	15.3 E.
6	23.5 E.	11	2.0 E.	15	22.9 E.	20	19.5 E.	26	16.0 E.	Dec. 1	12.6 E.
8	20.9 E.	12	23.3 E.	17	20.2 E.	22	16.8 E.	28	13.3 E.	3	9.9 E.
10	18.2 E.	14	20.6 E.	19	17.5 E.	24	14.1 E.	30	10.6 E.	5	7.2 E.
12	15.5 E.	16	17.9 E.	21	14.8 E.	26	11.4 E.	Nov. 1	7.9 E.	7	4.5 E.
14	12.8 E.	18	15.2 E.	23	12.1 E.	28	8.7 E.	3	5.2 E.	9	1.8 E.
16	10.2 E.	20	12.5 E.	25	9.4 E.	30	6.0 E.	5	2.5 E.	10	23.1 E.
18	7.5 E.	22	9.9 E.	27	6.7 E.	Oct. 2	3.3 E.	6	23.8 E.	12	20.4 E.
20	4.8 E.	24	7.2 E.	29	4.0 E.	4	0.6 E.	8	21.1 E.	14	17.7 E.
22	2.1 E.	26	4.5 E.	31	1.3 E.	5	21.9 E.	10	18.4 E.	16	15.0 E.
23	23.5 E.	28	1.8 E.	Sept. 1	22.6 E.	7	19.2 E.	12	15.7 E.	18	12.3 E.
25	20.8 E.	29	23.1 E.	3	19.9 E.	9	16.4 E.	14	12.9 E.	20	9.6 E.
27	18.1 E.	31	20.4 E.	5	17.2 E.	11	13.7 E.	16	10.2 E.	22	6.9 E.
29	15.5 E.	Aug. 2	17.7 E.	7	14.5 E.	13	11.0 E.	18	7.5 E.	24	4.2 E.
31	12.8 E.	4	15.1 E.	9	11.8 E.	15	8.3 E.	20	4.8 E.	26	1.5 E.
July 3	12.7 E.	6	12.4 E.	11	9.1 E.	17	5.6 E.	22	2.1 E.	27	22.8 E.
		8	9.7 E.	13	6.4 E.	19	2.9 E.	23	23.4 E.	29	20.1 E.

## DIONE.

Jan.	d h	July	d h	Aug.	d h	Sept.	d h	Oct.	d h	Nov.	d h
3	16.7 E.	8	22.6 E.	13	12.7 E.	18	2.5 E.	23	15.9 E.	28	5.4 E.
6	10.4 E.	11	16.4 E.	16	6.4 E.	20	20.1 E.	26	9.6 E.	30	23.1 E.
9	4.2 E.	14	10.1 E.	19	0.1 E.	23	13.8 E.	29	3.2 E.	Dec. 3	16.7 E.
11	21.9 E.	17	3.8 E.	21	17.8 E.	26	7.4 E.	31	20.9 E.	6	10.4 E.
14	15.6 E.	19	21.5 E.	24	11.5 E.	29	1.1 E.	Nov. 3	14.5 E.	9	4.1 E.
17	9.3 E.	22	15.2 E.	27	5.2 E.	Oct. 1	18.7 E.	6	8.2 E.	11	21.7 E.
20	3.0 E.	25	8.9 E.	29	22.8 E.	4	12.4 E.	9	1.8 E.	14	15.4 E.
22	20.7 E.	28	2.6 E.	Sept. 1	16.5 E.	7	6.0 E.	11	19.5 E.	17	9.1 E.
25	14.4 E.	30	20.3 E.	4	10.2 E.	9	23.7 E.	14	13.1 E.	20	2.8 E.
28	8.1 E.	Aug. 2	14.0 E.	7	3.8 E.	12	17.3 E.	17	6.8 E.	22	20.4 E.
31	1.9 E.	5	7.7 E.	9	21.5 E.	15	11.0 E.	20	0.4 E.	25	14.1 E.
July 6	4.9 E.	8	1.4 E.	12	15.2 E.	18	4.6 E.	22	18.0 E.	28	7.8 E.
		10	19.1 E.	15	8.8 E.	20	22.3 E.	25	11.7 E.	31	1.5 E.



RHEA.				TITAN.				HYPERION.							
Jan.	d	h		Sept.	d	h		Jan.	d	h		Sept.	d	h	
	2	13.0	E.		26	7.0	E.	Jan.	3	18.4	S.		5	2	W.
	7	1.4	E.		30	19.4	E.		7	21.6	E.		10	5	S.
	11	13.9	E.	Oct.	5	7.7	E.		12	1.0	I.		13	7	W.
	16	2.4	E.		9	20.0	E.		15	21.4	W.		18	6	E.
	20	14.9	E.		14	8.3	E.		19	17.8	S.		21	9	I.
					18	20.6	E.						24	8	W.
July	16	0.5	E.		23	9.0	E.	Aug.	4	1.1	E.		30	5	S.
	20	13.0	E.		27	21.3	E.		8	3.7	I.		3	9	E.
	25	1.5	E.	Nov.	1	9.6	E.		11	23.6	W.	Nov.	7	12	W.
	29	13.9	E.		5	21.9	E.		15	20.4	S.		11	15	I.
Aug.	3	2.4	E.		10	10.2	E.		20	0.0	E.		15	10	W.
	7	14.8	E.		14	22.5	E.		24	2.5	I.		19	7	S.
	12	3.2	E.		19	10.9	E.		27	22.3	W.		23	10	E.
	16	15.7	E.		23	23.2	E.		31	19.0	S.		27	12	I.
	21	4.1	E.		28	11.5	E.	Sept.	4	22.4	E.	Dec.	1	8.4	W.
	25	16.5	E.	Dec.	2	23.9	E.		9	0.8	I.		5	4	S.
	30	4.9	E.		7	12.3	E.		12	20.5	W.		9	8	E.
Sept.	3	17.3	E.		12	0.6	E.		16	17.1	S.		13	10	I.
	8	5.6	E.		16	13.0	E.		20	20.4	E.		17	6	W.
	12	18.0	E.		21	1.4	E.		24	22.7	I.		21	2	S.
	17	6.3	E.		25	13.8	E.		28	18.3	W.		25	6	E.
	21	18.7	E.		30	2.2	E.	Oct.	2	14.8	S.		29	9	I.

IAPETUS.

Jan.	d	h		July	d	h		Aug.	d	h		Sept.	d	h		Nov.	d	h		Dec.	d	h	
	5.1	E.		7.5	I.		15.7	S.	15.7	S.		25.0	I.		2.1	S.		12.0	I.		12.0	I.	
	25.7	I.		27.5	W.		4.6	E.	4.6	E.		14.4	W.		21.7	E.		31.7	W.		31.7	W.	

THE APPARENT ELEMENTS OF SATURN'S RINGS.

Washington Mean Noon.	<i>a</i>		<i>b</i>		<i>β</i> Inclination of Northern Semi-minor Axis to Circle of Declination from North to East.	<i>l</i> The Elevation of the Earth above the Plane of the Ring.	<i>l'</i> The Elevation of the Sun above the Plane of the Ring.	<i>u</i> <i>u'</i> Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on—	
	Outer Major Axis.	Outer Minor Axis.	Outer Major Axis.	Outer Minor Axis.				Equator.	Ecliptic.
Jan.	0	40.99	- 7.53	2 27.6	- 10 35.1	- 13 5.8	69 4.7	26 28.6	
	20	39.56	7.53	2 23.0	11 0.1	13 22.6	69 45.9	27 9.9	
Feb.	9	38.32	7.75	2 14.4	11 40.0	13 39.2	71 3.1	28 27.2	
Mar.	1	37.36	8.10	2 2.4	12 30.8	13 55.7	72 49.5	30 13.7	
	21	36.73	8.56	1 47.7	13 28.3	14 12.2	74 57.3	32 21.6	
Apr.	10	36.44	- 9.10	1 31.4	- 14 28.0	- 14 28.5	77 17.9	34 42.3	
	30	36.51	9.71	1 14.4	15 25.9	14 44.7	79 43.2	37 7.6	
May	20	36.91	10.37	0 57.6	16 18.8	15 0.9	82 4.8	39 29.3	
June	9	37.65	11.04	0 42.0	17 3.7	15 16.9	84 14.4	41 39.0	
	29	38.68	11.72	0 28.8	17 38.4	15 32.8	86 3.4	43 28.1	
July	19	39.97	- 12.36	0 19.1	- 18 1.2	- 15 48.7	87 23.7	44 48.5	
Aug.	8	41.43	12.92	0 13.7	18 10.7	16 4.4	88 7.8	45 32.7	
	28	42.91	13.34	0 13.3	18 6.4	16 20.0	88 11.2	45 36.1	
Sept.	17	44.22	13.53	0 17.8	17 49.2	16 35.5	87 33.7	44 58.7	
Oct.	7	45.14	13.47	0 26.5	17 21.7	16 50.9	86 22.0	43 47.1	
	27	45.47	- 13.15	0 37.6	- 16 48.9	- 17 6.2	84 50.7	42 15.9	
Nov.	16	45.12	12.66	0 48.5	16 17.8	17 21.3	83 19.5	40 44.8	
Dec.	6	44.17	12.12	0 57.1	15 55.5	17 36.3	82 8.1	39 33.4	
	26	42.83	11.65	1 1.3	15 47.4	17 51.3	81 31.3	38 56.7	
	31	42.53	- 11.58	1 1.8	- 15 47.9	17 55.0	81 28.6	38 54.0	

The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring = 0.8801,      log factor = 9.9445  
The outer ellipse of the inner ring = 0.8599,      log factor = 9.9344  
The inner ellipse of the inner ring = 0.6650,      log factor = 9.8228  
The inner ellipse of the dusky ring = 0.5486,      log factor = 9.7392

NOTE.—The negative sign of *l* indicates that the visible surface of the ring is the southern one.

## SIXTH SATELLITE OF JUPITER.

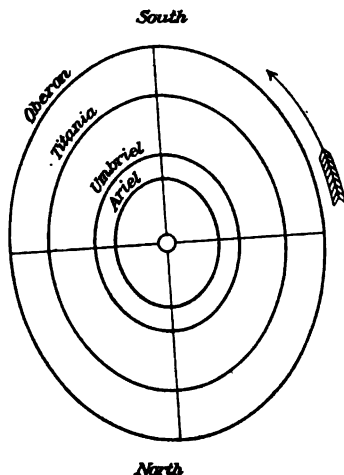
DIFFERENTIAL COORDINATES OF JUPITER'S SIXTH SATELLITE FOR 1909-10.								
Wash. Mean Noon.	$\alpha_{VI} - \alpha_{Jup.}$	$\delta_{VI} - \delta_{Jup.}$	Wash. Mean Noon.	$\alpha_{VI} - \alpha_{Jup.}$	$\delta_{VI} - \delta_{Jup.}$	Wash. Mean Noon.	$\alpha_{VI} - \alpha_{Jup.}$	$\delta_{VI} - \delta_{Jup.}$
1909.	m s	' "	1910.	m s	' "	1910.	m s	' "
Nov. 13	+1 12.8	-1 54	Feb. 13	-4 13.9	-6 31	May 20	+1 51.4	+5 52
17	0 59.2	2 45	17	4 18.1	5 49	24	2 7.7	5 48
21	0 44.8	3 36	21	4 20.2	5 2	28	2 21.5	5 39
25	0 29.7	4 25	25	4 20.4	4 14	June 1	2 32.8	5 26
29	+0 13.9	5 13	Mar. 1	4 18.5	3 24	5	2 41.3	5 9
Dec. 3	-0 2.4	5 58	5	4 14.4	2 34	9	2 47.0	4 47
7	0 19.1	6 40	9	4 8.1	1 45	13	2 49.9	4 21
11	0 36.1	7 18	13	3 59.5	0 57	17	2 49.9	3 51
15	0 53.2	7 51	17	3 48.6	-0 12	21	2 47.1	3 15
19	1 10.2	8 21	21	3 35.5	+0 30	25	2 41.7	2 36
23	1 27.2	8 47	25	3 20.1	1 10	29	2 34.0	1 53
27	1 44.1	9 7	29	3 2.7	1 48	July 3	2 24.3	1 8
31	-2 0.8	-9 23	Apr. 2	2 43.4	2 23	7	2 12.8	+0 21
1910			6	2 22.5	2 56	11	1 59.8	-0 28
Jan. 4	-2 17.0	-9 32	10	2 0.2	3 26	15	1 45.6	1 17
8	2 32.7	9 36	14	1 36.7	3 54	19	1 30.5	2 6
12	2 47.8	9 35	18	1 12.2	4 19	23	1 14.8	2 55
16	3 2.3	9 29	22	0 47.1	4 41	27	0 58.8	3 42
20	3 16.1	9 17	26	-0 21.9	5 0	31	0 42.7	4 27
24	3 28.8	9 1	30	+0 2.9	5 17	Aug. 4	0 26.6	5 9
28	3 40.4	8 39	May 4	0 27.0	5 31	8	+0 10.7	5 49
Feb. 1	3 50.9	8 13	8	0 50.1	5 42	12	-0 5.0	6 25
5	4 0.1	7 43	12	1 12.1	5 49	16	-0 20.5	-6 57
9	-4 7.8	-7 9	16	+1 32.8	+5 52			

## NINTH SATELLITE OF SATURN.

DIFFERENTIAL COORDINATES OF PHOEBE FOR 1910.					
Washington Mean Noon.	$\alpha_{Ph.} - \alpha_{Sat'n.}$	$\delta_{Ph.} - \delta_{Sat'n.}$	Washington Mean Noon.	$\alpha_{Ph.} - \alpha_{Sat'n.}$	$\delta_{Ph.} - \delta_{Sat'n.}$
	m s	' "		m s	' "
Jan. 0	+2 17.1	+17.3	Aug. 18	-1 32.6	-9.7
5	2 16.4	17.2	23	1 36.5	10.2
10	2 15.4	17.0	28	1 39.9	10.7
15	2 14.2	16.8	Sept. 2	1 42.8	11.1
20	2 12.7	16.6	7	1 45.1	11.4
25	2 10.9	16.4	12	1 46.8	11.7
30	2 8.8	16.1	17	1 48.0	11.9
Feb. 4	2 6.5	15.8	22	1 48.5	12.0
9	2 3.9	15.4	27	1 48.4	12.1
14	2 1.1	15.0	Oct. 2	1 47.6	12.1
19	1 58.0	14.6	7	1 46.3	12.1
24	+1 54.6	+14.2	12	1 44.3	11.9
			17	1 41.8	11.8
June 4	+0 1.9	+0.7	22	1 38.6	11.5
9	-0 5.3	-0.1	27	1 34.9	11.2
14	0 12.4	0.9	Nov. 1	1 30.7	10.8
19	0 19.6	1.7	6	1 26.1	10.3
24	0 26.7	2.4	11	1 20.9	9.8
29	0 33.7	3.2	16	1 15.3	9.2
July 4	0 40.6	3.9	21	1 9.4	8.5
9	0 47.4	4.7	26	1 3.1	7.8
14	0 54.0	5.4	Dec. 1	0 56.5	7.1
19	1 0.5	6.1	6	0 49.7	6.3
24	1 6.7	6.8	11	0 42.6	5.5
29	1 12.6	7.4	16	0 35.4	4.7
Aug. 3	1 18.2	8.0	21	0 28.1	3.8
8	1 23.4	8.6	26	0 20.7	2.9
13	-1 28.2	-9.2	31	-0 13.3	-2.1

*Apparent Apsides.*

Date.	Position Angle.	App. Distances.	
	°	"	"
Apr. 28,	2.4	13.6	19.0
July 17,	3.8	14.2	19.8
Oct. 5,	5.2	13.6	18.9

*Apparent Apsides.*

Date.	Position Angle.	App. Distances.	
	°	"	"
Apr. 28,	2.4	31.1	41.6
July 17,	3.8	32.4	43.3
Oct. 5,	5.2	31.0	41.5

APPARENT ORBITS OF THE SATELLITES OF URANUS AT DATE OF OPPOSITION,  
JULY 16, 1910, AS SEEN IN AN INVERTING TELESCOPE.

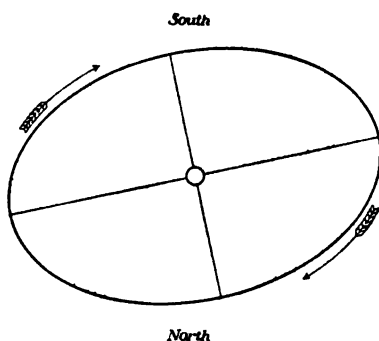
## WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
Apr. 24 20.8	Apr. 28 15.5	Apr. 25 15.8	Apr. 27 17.5	Apr. 18 11.9	Apr. 22 20.4	May 14 13.2 N.
May 2 10.3	May 6 5.0	May 3 22.7	May 6 0.4	27 4.8	May 1 13.3	21 6.8 S.
9 23.7	13 18.4	12 5.6	14 7.4	May 5 21.8	10 6.2	28 0.4 N.
17 13.2	21 7.9	20 12.5	22 14.3	14 14.7	18 23.2	June 3 18.0 S.
25 2.6	28 21.4	28 19.5	30 21.2	23 7.6	27 16.1	10 11.6 N.
June 1 16.1	June 5 10.8	June 6 2.4	June 8 4.1	June 1 0.6	June 5 9.1	17 5.3 S.
9 5.6	13 0.3	14 9.3	16 11.1	9 17.6	14 2.1	23 22.9 N.
16 19.0	20 13.8	22 16.3	24 18.0	18 10.6	22 19.1	30 16.5 S.
24 8.5	28 3.2	30 23.2	July 3 1.0	27 3.6	July 1 12.1	July 7 10.2 N.
July 1 22.0	July 5 16.7	July 9 6.2	11 7.9	July 5 20.6	10 5.1	14 3.8 S.
9 11.5	13 6.2	17 13.1	19 14.9	14 13.6	18 22.1	20 21.5 N.
17 1.0	20 19.7	25 20.1	27 21.8	23 6.6	27 15.2	27 15.1 S.
24 14.4	28 9.2	Aug. 3 3.1	Aug. 5 4.8	31 23.7	Aug. 5 8.2	Aug. 3 8.8 N.
Aug. 1 3.9	Aug. 4 22.7	11 10.0	13 11.8	Aug. 9 16.7	14 1.2	10 2.4 S.
8 17.4	12 12.2	19 17.0	21 18.7	18 9.7	22 18.2	16 20.1 N.
16 6.9	20 1.7	27 23.9	30 1.7	27 2.7	31 11.2	23 13.8 S.
23 20.4	27 15.2	Sept. 5 6.9	Sept. 7 8.6	Sept. 4 19.7	Sept. 9 4.2	30 7.4 N.
31 9.9	Sept. 4 4.7	13 13.8	15 15.6	13 12.7	17 21.2	Sept. 6 1.0 S.
Sept. 7 23.4	11 18.2	21 20.8	23 22.5	22 5.7	26 14.2	12 18.6 N.
15 12.9	19 7.6	30 3.7	Oct. 2 5.5	30 22.7	Oct. 5 7.1	19 12.2 S.
23 2.4	26 21.1	Oct. 8 10.7	10 12.4	Oct. 9 15.6	14 0.1	26 5.8 N.
30 15.9	Oct. 4 10.6	16 17.6	18 19.3	18 8.6	22 17.0	2 23.4 S.
Oct. 8 5.4	12 0.1	25 0.5	27 2.3	27 1.5	31 9.9	9 16.9 N.
15 18.8	19 13.6	Nov. 2 7.4	Nov. 4 9.2	Nov. 4 18.4	Nov. 9 2.8	16 10.5 S.
23 8.3	27 3.0	10 14.4	12 16.1	13 11.3	17 19.7	23 4.0 N.

Period of Ariel, d h  
2 12.489  
Period of Umbriel, 4 3.460

Period of Titania, d h  
8 16.942  
Period of Oberon, 13 11.119

NOTE.—For Ariel only every third elongation is given, and for Umbriel every alternate one. The intermediate ones may be found by adding multiples of the period of the satellite.



Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
	°	"
Jan. 10,	102.1	16.8
Apr. 20,	100.5	16.2
Sept. 19,	106.1	16.1
Dec. 28,	105.3	16.8

*APPARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION,  
JANUARY 8, 1910, AS SEEN IN AN INVERTING TELESCOPE.*

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

East.		West.		East.		West.		East.		West.	
d	h	d	h	d	h	d	h	d	h	d	h
Jan.	2 16.6	Jan.	5 15.2	Mar.	26 0.1	Mar.	28 22.6	Oct.	11 17.2	Oct.	14 15.7
	8 13.7		11 12.3		31 21.2	Apr.	3 19.7		17 14.2		20 12.7
	14 10.8		17 9.4	Apr.	6 18.2		9 16.7		23 11.2		26 9.7
	20 8.0		23 6.5		12 15.3		15 13.8		29 8.2	Nov.	1 6.7
	26 5.1		29 3.7		18 12.3		21 10.8	Nov.	4 5.3		7 3.8
Feb.	1 2.2	Feb.	4 0.8		24 9.3		27 7.8		10 2.3		13 0.8
	6 23.4		9 21.9		30 6.3	May	3 4.8		15 23.4		18 21.9
	12 20.5		15 19.0	May	6 3.3		9 1.8		21 20.4		24 19.0
	18 17.6		21 16.2		12 0.3		14 22.8		27 17.5		30 16.1
	24 14.7		27 13.3		.....		.....	Dec.	3 14.6	Dec.	6 13.2
Mar.	2 11.8	Mar.	5 10.4	Sept.	18 5.2	Sept.	21 3.7		9 11.7		12 10.3
	8 8.0		11 7.4		24 2.2		27 0.7		15 8.8		18 7.4
	14 6.0		17 4.5		29 23.2	Oct.	2 21.7		21 5.9		24 4.5
	20 3.1		23 1.6	Oct.	5 20.2		8 18.7		27 3.1		30 1.6

The above times are the instants of each passage of the satellite through the apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, bearing in mind that the radius vector of the satellite describes equal areas in equal times.

The period of the satellite of Neptune is  $5^d 21^h.044$ .

NOTE—In the preceding diagrams the central circle represents the planet and is on the same scale as the orbits.



## WASHINGTON MEAN TIME.

## PLANETARY CONFIGURATIONS.

July			d h m			°		
1	9	37	♂	♂	♂	♂	♂	♂
3	12	47	♂	♀	♂	♀	♂	♂
4	6	-	♂	♂	♂	♂	♂	♂
5	0	45	♂	♂	♂	♂	♂	♂
6	11	30	♂	♂	♂	♂	♂	♂
7	20	-	♂	♂	♂	♂	♂	♂
8	3	3	♂	♂	♂	♂	♂	♂
11	14	-	♂	♂	♂	♂	♂	♂
12	9	2	♂	♂	♂	♂	♂	♂
12	11	-	♂	♂	♂	♂	♂	♂
15	15	-	♂	♂	♂	♂	♂	♂
15	23	-	♂	♂	♂	♂	♂	♂
18	23	-	♂	♂	♂	♂	♂	♂
21	3	58	♂	♂	♂	♂	♂	♂
22	12	-	♂	♂	♂	♂	♂	♂
22	18	-	♂	♂	♂	♂	♂	♂
28	18	20	♂	♂	♂	♂	♂	♂
29	14	-	♂	♂	♂	♂	♂	♂
Aug. 2	6	10	♂	♂	♂	♂	♂	♂
2	21	50	♂	♂	♂	♂	♂	♂
5	13	-	♂	♂	♂	♂	♂	♂
5	19	42	♂	♂	♂	♂	♂	♂
5	20	18	♂	♂	♂	♂	♂	♂
9	1	18	♂	♂	♂	♂	♂	♂
10	8	-	♂	♂	♂	♂	♂	♂
14	3	-	♂	♂	♂	♂	♂	♂
15	5	-	♂	♂	♂	♂	♂	♂
17	10	37	♂	♂	♂	♂	♂	♂
19	16	-	♂	♂	♂	♂	♂	♂
25	0	37	♂	♂	♂	♂	♂	♂
25	10	-	♂	♂	♂	♂	♂	♂
30	6	0	♂	♂	♂	♂	♂	♂
30	6	0	♂	♂	♂	♂	♂	♂
Sept. 1	2	54	♂	♂	♂	♂	♂	♂
3	13	33	♂	♂	♂	♂	♂	♂
5	0	58	♂	♂	♂	♂	♂	♂
5	19	45	♂	♂	♂	♂	♂	♂
12	9	-	♂	♂	♂	♂	♂	♂
13	18	33	♂	♂	♂	♂	♂	♂
14	19	-	♂	♂	♂	♂	♂	♂
16	12	-	♂	♂	♂	♂	♂	♂
21	6	22	♂	♂	♂	♂	♂	♂
23	5	-	♂	♂	♂	♂	♂	♂
24	10	-	♂	♂	♂	♂	♂	♂
25	15	-	♂	♂	♂	♂	♂	♂
26	12	26	♂	♂	♂	♂	♂	♂
27	0	-	♂	♂	♂	♂	♂	♂
30	22	-	♂	♂	♂	♂	♂	♂
Oct. 1	6	59	♂	♂	♂	♂	♂	♂
1	11	34	♂	♂	♂	♂	♂	♂
2	9	1	♂	♂	♂	♂	♂	♂
2	20	-	♂	♂	♂	♂	♂	♂
Oct.			d h m			°		
3	14	53	♂	♂	♂	♂	♂	♂
3	19	-	♂	♂	♂	♂	♂	♂
3	23	-	♂	♂	♂	♂	♂	♂
8	10	-	♂	♂	♂	♂	♂	♂
8	15	-	♂	♂	♂	♂	♂	♂
11	2	55	♂	♂	♂	♂	♂	♂
11	4	-	♂	♂	♂	♂	♂	♂
14	21	-	♂	♂	♂	♂	♂	♂
15	2	-	♂	♂	♂	♂	♂	♂
18	12	-	♂	♂	♂	♂	♂	♂
18	13	4	♂	♂	♂	♂	♂	♂
18	17	-	♂	♂	♂	♂	♂	♂
22	6	-	♂	♂	♂	♂	♂	♂
23	18	42	♂	♂	♂	♂	♂	♂
24	22	-	♂	♂	♂	♂	♂	♂
26	16	-	♂	♂	♂	♂	♂	♂
26	19	-	♂	♂	♂	♂	♂	♂
27	18	-	♂	♂	♂	♂	♂	♂
29	8	-	♂	♂	♂	♂	♂	♂
31	6	20	♂	♂	♂	♂	♂	♂
31	9	48	♂	♂	♂	♂	♂	♂
31	16	54	♂	♂	♂	♂	♂	♂
31	18	37	♂	♂	♂	♂	♂	♂
Nov. 1	-	-	♂	♂	♂	♂	♂	♂
2	16	-	♂	♂	♂	♂	♂	♂
3	21	-	♂	♂	♂	♂	♂	♂
7	11	1	♂	♂	♂	♂	♂	♂
11	4	-	♂	♂	♂	♂	♂	♂
11	21	-	♂	♂	♂	♂	♂	♂
14	20	53	♂	♂	♂	♂	♂	♂
16	-	-	♂	♂	♂	♂	♂	♂
20	2	34	♂	♂	♂	♂	♂	♂
21	10	-	♂	♂	♂	♂	♂	♂
25	20	-	♂	♂	♂	♂	♂	♂
28	4	1	♂	♂	♂	♂	♂	♂
29	5	13	♂	♂	♂	♂	♂	♂
Dec. 1	7	39	♂	♂	♂	♂	♂	♂
2	4	57	♂	♂	♂	♂	♂	♂
3	16	-	♂	♂	♂	♂	♂	♂
4	18	59	♂	♂	♂	♂	♂	♂
11	19	-	♂	♂	♂	♂	♂	♂
12	4	48	♂	♂	♂	♂	♂	♂
17	12	17	♂	♂	♂	♂	♂	♂
22	0	-	♂	♂	♂	♂	♂	♂
24	1	-	♂	♂	♂	♂	♂	♂
25	21	12	♂	♂	♂	♂	♂	♂
26	6	-	♂	♂	♂	♂	♂	♂
28	5	5	♂	♂	♂	♂	♂	♂
30	19	-	♂	♂	♂	♂	♂	♂
31	8	-	♂	♂	♂	♂	♂	♂
31	14	-	♂	♂	♂	♂	♂	♂
31	16	41	♂	♂	♂	♂	♂	♂

## POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington	From Greenwich.
				h m s	h m s
Abastuman . . . . .	+ 41 42 24	- 11 35.5	9.999 351	- 7 59 41	- 2 51 25
Åbo . . . . .	+ 60 26 56.8	- 10 2.1	9.998 887	- 6 37 22.20	- 1 29 6.42
Adelaide . . . . .	- 34 55 38.5	+ 10 56.8	9.999 520	+ 9 37 23.92	- 9 14 20.30
Albany ( <i>New Obs.</i> ) . . . . .	+ 42 39 12.7	- 11 38.0	9.999 326	- 0 13 9.0	+ 4 55 6.8
Albany ( <i>Old Obs.</i> ) . . . . .	+ 42 39 49.5	- 11 38.0	9.999 326	- 0 13 15.79	+ 4 54 59.99
Alfred ( <i>N. Y.</i> ) . . . . .	+ 42 15 19.8	- 11 37.0	9.999 337	+ 0 2 51.37	+ 5 11 7.15
Algiers ( <i>New Obs.</i> ) . . . . .	+ 36 47 50	- 11 11.3	9.999 474	- 5 20 24.33	- 0 12 8.55
Algiers ( <i>Old Obs.</i> ) . . . . .	+ 36 44 0	- 11 10.8	9.999 476	- 5 20 32.6	- 0 12 16.8
Allegheny . . . . .	+ 40 27 41.6	- 11 31.3	9.999 383	+ 0 11 47.15	+ 5 20 2.93
Altona . . . . .	+ 53 32 45.3	- 11 10.2	9.999 049	- 5 48 2.02	- 0 39 46.24
Amherst ( <i>New Obs.</i> ) . . . . .	+ 42 21 56.5	- 11 37.3	9.999 334	- 0 18 9.85	+ 4 50 5.93
Amherst ( <i>Old Obs.</i> ) . . . . .	+ 42 22 17.1	- 11 37.3	9.999 334	- 0 18 11.11	+ 4 50 4.67
Annapolis . . . . .	+ 38 58 53.5	- 11 24.5	9.999 420	- 0 2 19.29	+ 5 5 56.49
Ann Arbor . . . . .	+ 42 16 48.0	- 11 37.0	9.999 336	+ 0 26 39.41	+ 5 34 55.19
Arequipa ( <i>Harvard</i> ) . . . . .	- 16 22 28.0	+ 6 17.8	9.999 884	- 0 22 4.05	+ 4 46 11.73
Armagh . . . . .	+ 54 21 12.7	- 11 4.2	9.999 029	- 4 41 40.4	+ 0 26 35.4
Athens . . . . .	+ 37 58 20.7	- 11 18.9	9.999 445	- 6 43 8.70	- 1 34 52.92
Bamberg . . . . .	+ 49 53 6.0	- 11 30.7	9.999 141	- 5 51 49.43	- 0 43 33.65
Beloit . . . . .	+ 42 30 8.4	- 11 37.6	9.999 331	+ 0 47 51.5	+ 5 56 7.3
Bergen . . . . .	+ 60 23 54	- 10 2.7	9.998 888	- 5 29 28.53	- 0 21 12.75
Berkeley . . . . .	+ 37 52 23.6	- 11 18.3	9.999 448	+ 3 0 46.94	+ 8 9 2.72
Berlin . . . . .	+ 52 30 16.7	- 11 17.1	9.999 075	- 6 1 50.63	- 0 53 34.85
Berlin ( <i>Urania</i> ) . . . . .	+ 52 31 30.7	- 11 17.0	9.999 075	- 6 1 43.23	- 0 53 27.45
Berne . . . . .	+ 46 57 8.7	- 11 39.0	9.999 216	- 5 38 1.51	- 0 29 45.73
Besançon . . . . .	+ 47 14 59.0	- 11 38.5	9.999 208	- 5 32 12.95	- 0 23 57.17
Bethlehem . . . . .	+ 40 36 23.1	- 11 31.9	9.999 379	- 0 6 43.93	+ 5 1 31.85
Birr Castle . . . . .	+ 53 5 47.0	- 11 13.3	9.999 060	- 4 36 34.9	+ 0 31 40.9
Bogota . . . . .	+ 4 36 15.4	- 1 51.5	9.999 991	- 0 11 21.58	+ 4 56 54.20
Bologna . . . . .	+ 44 29 54	- 11 40.3	9.999 279	- 5 53 40.7	- 0 45 24.9
Bombay . . . . .	+ 18 53 45	- 7 8.1	9.999 847	- 9 59 31.52	- 4 51 15.74
Bonn . . . . .	+ 50 43 45.0	- 11 26.9	9.999 120	- 5 36 39.00	- 0 28 23.22
Bordeaux . . . . .	+ 44 50 7.2	- 11 40.4	9.999 271	- 5 6 10.24	+ 0 2 5.54
Boston ( <i>University</i> ) . . . . .	+ 42 21 32.5	- 11 37.2	9.999 334	- 0 24 0.8	+ 4 44 15.0
Bothkamp . . . . .	+ 54 12 9.6	- 11 5.3	9.999 033	- 5 48 47.0	- 0 40 31.2
Breslau . . . . .	+ 51 6 55.8	- 11 25.0	9.999 110	- 6 16 24.57	- 1 8 8.79
Brisbane . . . . .	- 27 28 0.0	+ 9 32.2	9.999 689	+ 8 39 37.82	- 10 12 6.40
Brussels ( <i>Uccle</i> ) . . . . .	+ 50 47 53	- 11 26.6	9.999 118	- 5 25 42.7	- 0 17 26.9
Brussels ( <i>Old Obs.</i> ) . . . . .	+ 50 51 10.7	- 11 26.3	9.999 117	- 5 25 44.51	- 0 17 28.73
Budapest . . . . .	+ 47 29 34.7	- 11 38.0	9.999 202	- 6 24 31.1	- 1 16 15.3
Cairo . . . . .	+ 30 4 38.2	- 10 6.5	9.999 632	- 7 13 24.69	- 2 5 8.91
Cambridge ( <i>England</i> ) . . . . .	+ 52 12 51.6	- 11 18.9	9.999 082	- 5 8 38.53	- 0 0 22.75
Cambridge ( <i>Mass.</i> ) . . . . .	+ 42 22 47.6	- 11 37.3	9.999 334	- 0 23 44.73	+ 4 44 31.05
Cape of Good Hope . . . . .	- 33 56 3.6	+ 10 48.0	9.999 543	- 6 22 10.54	- 1 13 54.76
Catania . . . . .	+ 37 30 13.3	- 11 16.0	9.999 457	- 6 8 36	- 1 0 20
Chapultepec . . . . .	+ 19 25 17.5	- 7 18.2	9.999 838	+ 1 28 22.52	+ 6 36 38.30
Charkow . . . . .	+ 50 0 9.6	- 11 30.2	9.999 138	- 7 33 11.55	- 2 24 55.77

POSITIONS OF OBSERVATORIES.						
(North Latitudes and West Longitudes are Considered Positive.)						
Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.		
				From Washington.	From Greenwich.	
	° ' "	' "		h m s	h m s	
Charlottesville . . . . .	+ 38 2 1.2	- 11 19.3	9.999 444	+ 0 5 49.44	+ 5 14 5.22	
Chicago ( <i>Old Obs.</i> ) . . . . .	+ 41 50 1.0	- 11 35.9	9.999 348	+ 0 42 11.06	+ 5 50 26.84	
Christiania . . . . .	+ 59 54 44.0	- 10 8.7	9.998 899	- 5 51 9.30	- 0 42 53.52	
Cincinnati ( <i>New Obs.</i> ) . . . . .	+ 39 8 19.5	- 11 25.4	9.999 416	+ 0 29 25.62	+ 5 37 41.40	
Cincinnati ( <i>Old Obs.</i> ) . . . . .	+ 39 6 26.5	- 11 25.2	9.999 417	+ 0 29 43.22	+ 5 37 59.00	
Clinton . . . . .	+ 43 3 17.0	- 11 38.7	9.999 316	- 0 6 38.33	+ 5 1 37.45	
Coimbra . . . . .	+ 40 12 24.5	- 11 30.3	9.999 389	- 4 34 32.7	+ 0 33 43.1	
Columbia ( <i>Missouri</i> ) . . . . .	+ 38 56 51.7	- 11 24.4	9.999 421	+ 1 1 2.55	+ 6 9 18.33	
Copenhagen . . . . .	+ 55 41 12.9	- 10 53.1	9.998 997	- 5 58 34.48	- 0 50 18.70	
Cordoba . . . . .	- 31 25 15.2	+ 10 22.2	9.999 602	- 0 51 27.56	+ 4 16 48.22	
Cracow . . . . .	+ 50 3 52.0	- 11 29.9	9.999 137	- 6 28 6.06	- 1 19 50.28	
Crowborough . . . . .	+ 51 3 14	- 11 25.4	9.999 112	- 5 8 54	- 0 0 38	
Dantzic . . . . .	+ 54 21 18.0	- 11 4.1	9.999 029	- 6 22 55.4	- 1 14 39.6	
Denver . . . . .	+ 39 40 36.4	- 11 27.9	9.999 402	+ 1 51 31.85	+ 6 59 47.63	
Dorpat . . . . .	+ 58 22 47.1	- 10 26.4	9.998 934	- 6 55 9.07	- 1 46 53.29	
Dresden . . . . .	+ 51 2 16.8	- 11 25.4	9.999 112	- 6 3 10.63	- 0 54 54.85	
Dublin . . . . .	+ 53 23 13.1	- 11 11.3	9.999 053	- 4 42 54.7	+ 0 25 21.1	
Dun Echt . . . . .	+ 57 9 36	- 10 39.2	9.998 962	- 4 58 35.8	+ 0 9 40.0	
Durham . . . . .	+ 54 46 6.2	- 11 0.9	9.999 019	- 5 1 56.03	+ 0 6 19.75	
Düsseldorf . . . . .	+ 51 12 25.0	- 11 24.6	9.999 108	- 5 35 20.8	- 0 27 5.0	
Edinburgh ( <i>Calton Hill</i> ) . . . . .	+ 55 57 23.2	- 10 50.7	9.998 991	- 4 55 32.7	+ 0 12 43.1	
Edinburgh ( <i>Royal Obs.</i> ) . . . . .	+ 55 55 28.0	- 10 50.9	9.998 991	- 4 55 31.6	+ 0 12 44.2	
Evanston ( <i>Dearborn</i> ) . . . . .	+ 42 3 33.4	- 11 36.5	9.999 342	+ 0 42 26.5	+ 5 50 42.3	
Flagstaff ( <i>Lowell</i> ) . . . . .	+ 35 12 30.4	- 10 59.2	9.999 513	+ 2 18 28.79	+ 7 26 44.57	
Florence ( <i>Reale Museo</i> ) . . . . .	+ 43 46 4.1	- 11 39.7	9.999 298	- 5 53 17.3	- 0 45 1.5	
Florence ( <i>Arcetri</i> ) . . . . .	+ 43 45 14.6	- 11 39.7	9.999 298	- 5 53 17.12	- 0 45 1.34	
Geneva . . . . .	+ 46 11 58.8	- 11 39.9	9.999 236	- 5 32 52.49	- 0 24 36.71	
Genoa . . . . .	+ 44 25 9.3	- 11 40.2	9.999 281	- 5 43 57.11	- 0 35 41.33	
Georgetown . . . . .	+ 38 54 26.7	- 11 24.2	9.999 422	+ 0 0 2.48	+ 5 8 18.26	
Glasgow ( <i>Missouri</i> ) . . . . .	+ 39 13 45.6	- 11 25.8	9.999 414	+ 1 3 2.30	+ 6 11 18.08	
Glasgow ( <i>Scotland</i> ) . . . . .	+ 55 52 42.8	- 10 51.5	9.998 993	- 4 51 5.23	+ 0 17 10.55	
Gohlis . . . . .	+ 51 21 35.0	- 11 23.7	9.999 104	- 5 57 45.43	- 0 49 29.65	
Gotha ( <i>Old Obs.</i> ) . . . . .	+ 50 56 5.2	- 11 26.0	9.999 114	- 5 51 10.88	- 0 42 55.10	
Gotha . . . . .	+ 50 56 37.9	- 11 25.9	9.999 114	- 5 51 6.27	- 0 42 50.49	
Göttingen . . . . .	+ 51 31 47.9	- 11 22.8	9.999 100	- 5 48 2.07	- 0 39 46.29	
Graz . . . . .	+ 47 4 37.2	- 11 38.8	9.999 213	- 6 10 4	- 1 1 48	
Greenwich . . . . .	+ 51 28 38.1	- 11 23.1	9.999 101	- 5 8 15.78	0 0 0.00	
Grignon . . . . .	+ 47 33 42	- 11 37.8	9.999 201	- 5 25 54	- 0 17 38	
Hamburg . . . . .	+ 53 33 7.0	- 11 10.1	9.999 049	- 5 48 9.6	- 0 39 53.8	
Hanover . . . . .	+ 43 42 15.3	- 11 39.6	9.999 300	- 0 19 7.87	+ 4 49 7.91	
Harrow . . . . .	+ 51 34 47.1	- 11 22.6	9.999 098	- 5 6 55.92	+ 0 1 19.86	
Hastings-on-Hudson . . . . .	+ 40 59 25	- 11 33.2	9.999 369	- 0 12 46.33	+ 4 55 29.45	
Haverford . . . . .	+ 40 0 40.1	- 11 29.4	9.999 394	- 0 7 3.08	+ 5 1 12.70	
Heidelberg . . . . .	+ 49 24 35	- 11 32.5	9.999 153	- 5 43 4.3	- 0 34 48.5	
Helsingfors . . . . .	+ 60 9 42.6	- 10 5.6	9.998 893	- 6 48 4.93	- 1 39 49.15	



## POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington.	From Greenwich.
	° ' "	' "		h m s	h m s
Hereny . . . . .	+ 47 15 47.4	- 11 38.4	9.999 208	- 6 14 40.5	- 1 6 24.7
Hongkong . . . . .	+ 22 18 13.4	- 8 10.7	9.999 789	+ 11 15 2.36	- 7 36 41.86
Hudson . . . . .	+ 41 14 42.6	- 11 34.1	9.999 363	+ 0 17 25.5	+ 5 25 41.3
Jamaica . . . . .	+ 18 24 51	- 6 58.7	9.999 854	+ 0 3 13.70	+ 5 11 29.48
Jena ( <i>University</i> ) . . . . .	+ 50 55 34.9	- 11 26.0	9.999 115	- 5 54 36.05	- 0 46 20.27
Kalocsa . . . . .	+ 46 31 41.7	- 11 39.6	9.999 227	- 6 24 10.12	- 1 15 54.34
Karlsruhe . . . . .	+ 49 0 29.6	- 11 33.9	9.999 163	- 5 41 52.2	- 0 33 36.4
Kasan . . . . .	+ 55 47 24.3	- 10 52.2	9.998 995	- 8 24 44.82	- 3 16 29.04
Kew . . . . .	+ 51 28 6	- 11 23.2	9.999 101	- 5 7 0.7	+ 0 1 15.1
Kiel . . . . .	+ 54 20 28.5	- 11 4.2	9.999 030	- 5 48 51.42	- 0 40 35.64
Kiew . . . . .	+ 50 27 10.5	- 11 28.2	9.999 127	- 7 10 16.42	- 2 2 0.64
Kis Kartal . . . . .	+ 47 41 54.8	- 11 37.5	9.999 197	- 6 26 27.5	- 1 18 11.7
Königsberg . . . . .	+ 54 42 50.4	- 11 1.3	9.999 021	- 6 30 14.82	- 1 21 59.04
Kremsmünster . . . . .	+ 48 3 23.1	- 11 36.7	9.999 188	- 6 4 47.37	- 0 56 31.59
La Plata . . . . .	- 34 54 30.3	+ 10 56.7	9.999 520	- 1 16 38.8	+ 3 51 37.0
Leiden . . . . .	+ 52 9 20.0	- 11 19.3	9.999 084	- 5 26 11.95	- 0 17 56.17
Leipzig . . . . .	+ 51 20 5.9	- 11 23.9	9.999 104	- 5 57 49.76	- 0 49 33.98
Liege ( <i>Cointe, Ougrée</i> ) . . . . .	+ 50 37 7	- 11 27.5	9.999 123	- 5 30 31.0	- 0 22 15.2
Lisbon ( <i>Marine Obs.</i> ) . . . . .	+ 38 42 17.6	- 11 23.3	9.999 427	- 4 31 42.20	+ 0 36 33.58
Lisbon ( <i>Royal Obs.</i> ) . . . . .	+ 38 42 31.3	- 11 23.1	9.999 427	- 4 31 31.10	+ 0 36 44.68
Liverpool . . . . .	+ 53 24 4.8	- 11 11.2	9.999 053	- 4 55 58.45	+ 0 12 17.33
Lübec . . . . .	+ 53 51 31.1	- 11 7.9	9.999 042	- 5 51 1.5	- 0 42 45.7
Lund . . . . .	+ 55 41 51.6	- 10 53.0	9.998 997	- 6 1 0.79	- 0 52 45.01
Lussinpiccolo ( <i>Manora</i> ) . . . . .	+ 44 32 11.0	- 11 40.3	9.999 278	- 6 6 8.19	- 0 57 52.41
Lyons . . . . .	+ 45 41 41.0	- 11 40.3	9.999 248	- 5 27 24.33	- 0 19 8.55
Madison . . . . .	+ 43 4 36.8	- 11 38.7	9.999 316	+ 0 49 22.15	+ 5 57 37.93
Madras . . . . .	+ 13 4 8.0	- 5 7.6	9.999 925	- 10 29 14.90	- 5 20 59.12
Madrid . . . . .	+ 40 24 29.7	- 11 31.1	9.999 384	- 4 53 30.66	+ 0 14 45.12
Manila . . . . .	+ 14 35 25	- 5 40.5	9.999 907	+ 10 47 54	- 8 3 50
Mannheim . . . . .	+ 49 29 11.0	- 11 32.2	9.999 151	- 5 42 6.23	- 0 33 50.45
Marburg . . . . .	+ 50 48 46.9	- 11 26.5	9.999 118	- 5 43 20.7	- 0 35 4.9
Markree . . . . .	+ 54 10 31.8	- 11 5.5	9.999 034	- 4 34 27.4	+ 0 33 48.4
Marseilles . . . . .	+ 43 18 17.5	- 11 39.1	9.999 310	- 5 29 50.37	- 0 21 34.59
Mauritius . . . . .	- 20 5 39	+ 7 30.8	9.999 828	- 8 58 28.4	- 3 50 12.6
Melbourne . . . . .	- 37 49 53.4	+ 11 18.1	9.999 449	+ 9 11 50.2	- 9 39 54.0
Meudon . . . . .	+ 48 48 18	- 11 34.6	9.999 169	- 5 17 11.4	- 0 8 55.6
Mexico . . . . .	+ 19 26 1.3	- 7 18.4	9.999 838	+ 1 28 10.95	+ 6 36 26.73
Middletown ( <i>Conn.</i> ) . . . . .	+ 41 33 16.0	- 11 35.1	9.999 355	- 0 17 38.60	+ 4 50 37.18
Milan . . . . .	+ 45 27 59.3	- 11 40.4	9.999 254	- 5 45 1.70	- 0 36 45.92
Modena . . . . .	+ 44 38 52.8	- 11 40.4	9.999 275	- 5 51 58.7	- 0 43 42.9
Moncalieri . . . . .	+ 44 59 51	- 11 40.4	9.999 266	- 5 39 5	- 0 30 49
Montreal . . . . .	+ 45 30 17.0	- 11 40.4	9.999 253	- 0 13 57.15	+ 4 54 18.63
Montsouris . . . . .	+ 48 49 18.0	- 11 34.5	9.999 168	- 5 17 36.46	- 0 9 20.68
Moscow . . . . .	+ 55 45 19.8	- 10 52.5	9.998 995	- 7 38 32.87	- 2 30 17.09
Mount Hamilton ( <i>Lick</i> ) . . . . .	+ 37 20 25.6	- 11 14.9	9.999 461	+ 2 58 19.11	+ 8 6 34.89
Munich . . . . .	+ 48 8 45.5	- 11 36.5	9.999 186	- 5 54 41.85	- 0 46 26.07

## POSITIONS OF OBSERVATORIES.

*(North Latitudes and West Longitudes are Considered Positive.)*

Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington.	From Greenwich.
	° ' "	' "		h m s	h m s
Naples . . . . .	+ 40 51 46.3	- 11 32.8	9.999 372	- 6 5 17.51	- 0 57 1.73
Nashville . . . . .	+ 36 8 54.4	- 11 6.6	9.999 490	+ 0 38 56.4	+ 5 47 12.2
Natal . . . . .	- 29 50 46.6	+ 10 3.7	9.999 637	- 7 12 16.96	- 2 4 1.18
Neuchatel . . . . .	+ 47 0 1.2	- 11 38.9	9.999 215	- 5 36 5.71	- 0 27 49.93
New Haven ( <i>Old Obs.</i> )	+ 41 18 36.5	- 11 34.3	9.999 361	- 0 16 33.64	+ 4 51 42.14
New Haven ( <i>Yale Univ.</i> )	+ 41 19 22.3	- 11 34.4	9.999 361	- 0 16 35.20	+ 4 51 40.58
New York ( <i>Columb. Coll.</i> )	+ 40 45 23.1	- 11 32.4	9.999 375	- 0 12 22.14	+ 4 55 53.64
New York ( <i>RUTHERFURD</i> )	+ 40 43 48.5	- 11 32.3	9.999 376	- 0 12 19.10	+ 4 55 56.68
Nice . . . . .	+ 43 43 16.9	- 11 39.6	9.999 299	- 5 37 27.96	- 0 29 12.18
Nicolaeff . . . . .	+ 46 58 21.8	- 11 38.9	9.999 216	- 7 16 9.58	- 2 7 53.80
Northfield . . . . .	+ 44 27 41.6	- 11 40.3	9.999 280	+ 1 4 20.03	+ 6 12 35.81
Oakland ( <i>Cal.</i> ) . . . . .	+ 37 48 5	- 11 17.9	9.999 449	+ 3 0 50.77	+ 8 9 6.55
Odessa . . . . .	+ 46 28 36.7	- 11 39.6	9.999 228	- 7 11 17.88	- 2 3 2.10
Ogden . . . . .	+ 41 13 8.6	- 11 34.0	9.999 363	+ 2 19 43.85	+ 7 27 59.63
O-Gyalla . . . . .	+ 47 52 27.3	- 11 37.1	9.999 192	- 6 21 1.32	- 1 12 45.54
Olmütz . . . . .	+ 49 35 43	- 11 31.8	9.999 149	- 6 17 24	- 1 9 8
Oxford ( <i>Mississippi</i> ) . . . . .	+ 34 22 12.6	- 10 52.0	9.999 533	+ 0 49 51.3	+ 5 58 7.1
Oxford ( <i>Radcliffe</i> ) . . . . .	+ 51 45 35.4	- 11 21.6	9.999 094	- 5 3 13.2	+ 0 5 2.6
Oxford ( <i>University</i> ) . . . . .	+ 51 45 34.2	- 11 21.6	9.999 094	- 5 3 15.4	+ 0 5 0.4
Padua . . . . .	+ 45 24 5	- 11 40.4	9.999 256	- 5 55 44.97	- 0 47 29.19
Palermo . . . . .	+ 38 6 44.0	- 11 19.7	9.999 442	- 6 1 41.68	- 0 53 25.90
Paramatta . . . . .	- 33 48 49.8	+ 10 46.9	9.999 546	+ 8 47 44.0	- 10 4 0.2
Paris . . . . .	+ 48 50 11.2	- 11 34.5	9.999 168	- 5 17 36.75	- 0 9 20.97
Philadelphia . . . . .	+ 39 57 7.5	- 11 29.2	9.999 396	- 0 7 37.27	+ 5 0 38.51
Philadelphia ( <i>Flower</i> ) . . . . .	+ 39 58 2.1	- 11 29.2	9.999 395	- 0 7 9.2	+ 5 1 6.6
Plonsk . . . . .	+ 52 37 40.0	- 11 16.4	9.999 072	- 6 29 47.8	- 1 21 32.0
Pola . . . . .	+ 44 51 48.7	- 11 40.4	9.999 270	- 6 3 38.67	- 0 55 22.89
Portsmouth . . . . .	+ 50 48 3	- 11 26.6	9.999 118	- 5 3 51.0	+ 0 4 24.8
Potsdam . . . . .	+ 52 22 56.0	- 11 17.9	9.999 078	- 6 0 31.7	- 0 52 15.9
Poughkeepsie . . . . .	+ 41 41 18	- 11 35.5	9.999 351	- 0 12 42.13	+ 4 55 33.65
Prague ( <i>University</i> ) . . . . .	+ 50 5 15.8	- 11 29.8	9.999 136	- 6 5 56.1	- 0 57 40.3
Princeton . . . . .	+ 40 20 57.8	- 11 30.8	9.999 385	- 0 9 38.17	+ 4 58 37.61
Princeton ( <i>Halsted</i> ) . . . . .	+ 40 20 55.8	- 11 30.9	9.999 386	- 0 9 36.34	+ 4 58 39.44
Providence ( <i>SEAGRAVE</i> ) . . . . .	+ 41 49 46.4	- 11 35.9	9.999 348	- 0 22 38.14	+ 4 45 37.64
Providence ( <i>Ladd</i> ) . . . . .	+ 41 50 21	- 11 35.9	9.999 348	- 0 22 39.83	+ 4 45 35.95
Pulkowa . . . . .	+ 59 46 18.7	- 10 10.4	9.998 902	- 7 9 34.42	- 2 1 18.64
Quebec . . . . .	+ 46 47 59.2	- 11 39.2	9.999 220	- 0 23 23.14	+ 4 44 52.64
Quito . . . . .	- 0 14 0	+ 0 5.7	0.000 000	+ 0 5 50.88	+ 5 14 6.66
Riga . . . . .	+ 56 57 9.3	- 10 41.3	9.998 967	- 6 44 43.95	- 1 36 28.17
Rio de Janeiro . . . . .	- 22 54 23.6	+ 8 21.1	9.999 779	- 2 15 34.4	+ 2 52 41.4
Rochester . . . . .	+ 43 9 16.8	- 11 38.8	9.999 314	+ 0 2 6.00	+ 5 10 21.78
Rome ( <i>Coll. Rom.</i> ) . . . . .	+ 41 53 53.6	- 11 36.1	9.999 346	- 5 58 11.33	- 0 49 55.55
Rome ( <i>Capitol</i> ) . . . . .	+ 41 53 33.5	- 11 36.0	9.999 346	- 5 58 12.15	- 0 49 56.37
Rome ( <i>Vatican</i> ) . . . . .	+ 41 54 4.8	- 11 36.1	9.999 346	- 5 58 5.25	- 0 49 49.47
Rousdon . . . . .	+ 50 42 38	- 11 27.0	9.999 120	- 4 56 16.84	+ 0 11 58.94
Rugby . . . . .	+ 52 22 7	- 11 18.0	9.999 079	- 5 3 13.8	+ 0 5 2.0

## POSITIONS OF OBSERVATORIES.

(North Latitudes and West Longitudes are Considered Positive.)

Place.	Latitude.	Reduction to Geocentric Latitude.	Log $\rho$ .	Longitude.	
				From Washington.	From Greenwich.
	° ' "	' "		h m s	h m s
San Fernando . . .	+ 36 27 42.0	- 11 8.9	9.999 483	- 4 43 26.6	+ 0 24 49.2
San Francisco . . .	+ 37 47 27.9	- 11 17.8	9.999 450	+ 3 1 27.08	+ 8 9 42.86
Santiago de Chile . .	- 33 26 42.0	+ 10 43.4	9.999 555	- 0 25 29.56	+ 4 42 46.22
South Hadley . . .	+ 42 15 18.2	- 11 37.0	9.999 337	- 0 17 55.49	+ 4 50 20.29
Speier . . .	+ 49 18 55.2	- 11 32.9	9.999 156	- 5 42 1.34	- 0 33 45.56
St. Louis . . .	+ 38 38 3.0	- 11 22.7	9.999 429	+ 0 52 33.48	+ 6 0 49.26
St. Petersburg ( <i>Academy</i> )	+ 59 56 29.7	- 10 8.4	9.998 898	- 7 9 29.24	- 2 1 13.46
St. Petersburg ( <i>Univ.</i> )	+ 59 56 32.0	- 10 8.4	9.998 898	- 7 9 27.2	- 2 1 11.4
Stockholm . . .	+ 59 20 33.0	- 10 15.5	9.998 912	- 6 20 29.77	- 1 12 13.99
Stonyhurst . . .	+ 53 50 40	- 11 8.0	9.999 042	- 4 58 23.10	+ 0 9 52.68
Strassburg ( <i>New Obs.</i> )	+ 48 35 0.3	- 11 35.3	9.999 174	- 5 39 20.47	- 0 31 4.69
Strassburg ( <i>Old Obs.</i> )	+ 48 34 53.8	- 11 35.3	9.999 174	- 5 39 18.27	- 0 31 2.49
Sydney . . .	- 33 51 41.1	+ 10 47.3	9.999 545	+ 8 46 54.68	- 10 4 49.54
Syracuse . . .	+ 43 2 13.1	- 11 38.6	9.999 317	- 0 3 42.42	+ 5 4 33.36
Tacubaya . . .	+ 19 24 17.5	- 7 17.8	9.999 839	+ 1 28 30.75	+ 6 36 46.53
Taschkent . . .	+ 41 19 31.3	- 11 34.4	9.999 361	- 9 45 26.58	- 4 37 10.80
Tokio . . .	+ 35 39 17.5	- 11 2.8	9.999 502	+ 9 32 46.20	- 9 18 58.02
Toronto . . .	+ 43 39 35.9	- 11 39.6	9.999 301	+ 0 9 18.87	+ 5 17 34.65
Toulouse . . .	+ 43 36 45	- 11 39.5	9.999 302	- 5 14 5.66	- 0 5 49.88
Trieste . . .	+ 45 38 45.4	- 11 40.3	9.999 250	- 6 3 18.73	- 0 55 2.95
Troy ( <i>N. Y.</i> ) . . .	+ 42 43 52.9	- 11 38.1	9.999 325	- 0 13 33.49	+ 4 54 42.29
Tulse Hill . . .	+ 51 26 47.0	- 11 23.3	9.999 102	- 5 7 48.1	+ 0 0 27.7
Turin . . .	+ 45 4 8.0	- 11 40.4	9.999 265	- 5 39 2.96	- 0 30 47.18
Tuscaloosa ( <i>Ala. Univ.</i> )	+ 33 12 36.8	- 10 41.1	9.999 561	+ 0 41 55.96	+ 5 50 11.74
Twickenham . . .	+ 51 27 4.2	- 11 23.3	9.999 102	- 5 7 2.7	+ 0 1 13.1
Upsala ( <i>New Obs.</i> ) . .	+ 59 51 29.4	- 10 9.3	9.998 900	- 6 18 45.93	- 1 10 30.15
Utrecht . . .	+ 52 5 9.6	- 11 19.7	9.999 086	- 5 28 46.8	- 0 20 31.0
Venice . . .	+ 45 26 10.5	- 11 40.4	9.999 255	- 5 57 37.90	- 0 49 22.12
Vienna ( <i>Josephstadt</i> )	+ 48 12 53.8	- 11 36.2	9.999 183	- 6 13 41.1	- 1 5 25.3
Vienna ( <i>New Obs.</i> ) . .	+ 48 13 55.4	- 11 36.2	9.999 183	- 6 13 37.17	- 1 5 21.39
Vienna ( <i>Old Obs.</i> ) . .	+ 48 12 35.5	- 11 36.3	9.999 184	- 6 13 47.42	- 1 5 31.64
Vienna ( <i>Ottakring</i> ) . .	+ 48 12 46.7	- 11 36.2	9.999 183	- 6 13 26.89	- 1 5 11.11
Warsaw . . .	+ 52 13 4.7	- 11 18.9	9.999 082	- 6 32 23.06	- 1 24 7.28
Washington . . .	+ 38 55 14.0	- 11 24.2	9.999 422	0 0 0.00	+ 5 8 15.78
Washington ( <i>Old Obs.</i> )	+ 38 53 38.8	- 11 24.1	9.999 422	- 0 0 3.63	+ 5 8 12.15
Washington ( <i>Smithsonian</i> )	+ 38 53 17.3	- 11 24.1	9.999 422	- 0 0 9.6	+ 5 8 6.2
Washington ( <i>Cath. Univ.</i> )	+ 38 56 14.8	- 11 24.2	9.999 422	- 0 0 15.78	+ 5 8 0.00
Wellington . . .	- 41 18 0.6	+ 11 34.3	9.999 361	+ 7 12 37.70	- 11 39 6.52
West Point ( <i>Old Obs.</i> )	+ 41 23 31	- 11 34.6	9.999 359	- 0 12 26.34	+ 4 55 49.44
West Point ( <i>New Obs.</i> )	+ 41 23 22.1	- 11 34.6	9.999 359	- 0 12 25.23	+ 4 55 50.55
Wilhelmshaven . . .	+ 53 31 52.2	- 11 10.3	9.999 050	- 5 40 50.89	- 0 32 35.11
Williamstown ( <i>Mass.</i> )	+ 42 42 30	- 11 38.0	9.999 325	- 0 15 26	+ 4 52 50
Williamstown ( <i>Victoria</i> )	- 37 52 7.2	+ 11 18.3	9.999 448	+ 9 12 6.1	- 9 39 38.1
Wilna . . .	+ 54 40 59.1	- 11 1.6	9.999 021	- 6 49 24.60	- 1 41 8.82
Windsor . . .	- 33 36 30.8	+ 10 44.9	9.999 551	+ 8 48 23.7	- 10 3 20.5
Williams Bay ( <i>Yerkes</i> )	+ 42 34 12.6	- 11 37.7	9.999 329	+ 0 45 57.46	+ 5 54 13.24
Zürich . . .	+ 47 22 40.0	- 11 38.2	9.999 205	- 5 42 28.08	- 0 34 12.30



## PART IV.

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APPARENT PLACES OF STARS, STAR-NUMBERS  
AND OTHER DATA,  
BASED ON THE CONSTANTS OF THE  
PARIS CONFERENCE OF 1896.

FORMULÆ FOR THE REDUCTION OF THE POSITIONS OF THE FIXED STARS, USING THE NOTATION OF BESSEL, AND THE CONSTANTS OF THE PARIS CONFERENCE OF MAY, 1896.

NOTATION.

- $\tau$ , the time reckoned in units of one year, from the beginning of the Besselian fictitious year (1910, January 0<sup>d</sup>.521, Washington mean time),  
 $a_0, \delta_0$ , the star's mean right ascension and declination at the beginning of the fictitious year,  
 $a, \delta$ , the star's apparent right ascension and declination at the time  $\tau$ ,  
 $\mu, \mu'$ , the annual proper motion in right ascension and declination,  
 $\odot$ , the Sun's true longitude,  
 $L$ , the Sun's mean longitude,  
 $\Omega$ , the longitude of the Moon's ascending node, |  $\omega$ , the obliquity of the ecliptic,  
 $\Gamma'$ , the longitude of the Moon's perigee,  
 $\zeta$ , the Moon's mean longitude.

BESSELIAN STAR-NUMBERS.

$$\begin{aligned} A = & \tau - 0.342\ 18 \sin \Omega & + 0.000\ 24 \sin (\zeta + \Gamma') \\ & + 0.004\ 15 \sin 2 \Omega & + 0.001\ 33 \sin (\zeta - \Gamma') \\ & - 0.024\ 95 \sin 2 L & - 0.000\ 68 \sin (2 \zeta - \Omega) \\ & + 0.002\ 18 \sin (L + 75^\circ.3) & - 0.000\ 52 \sin (3 \zeta - \Gamma') \\ & - 0.000\ 97 \sin (3 L + 78^\circ.7) & + 0.000\ 30 \sin (\zeta - 2 L + \Gamma') \\ & + 0.000\ 24 \sin (2 L - \Omega) & + 0.000\ 12 \sin 2 (\zeta - L) \\ & - 0.004\ 05 \sin 2 \zeta & \\ B = & - 9.210 \cos \Omega & + 0.007 \cos (2 L - \Omega) \\ & + 0.090 \cos 2 \Omega & - 0.088 \cos 2 \zeta \\ & - 0.546 \cos 2 L & - 0.018 \cos (2 \zeta - \Omega) \\ & - 0.021 \cos (3 L + 78^\circ.7) & - 0.011 \cos (3 \zeta - \Gamma') \\ & + 0.009 \cos (L - 78^\circ.7) & + 0.005 \cos (\zeta + \Gamma') \\ C = & - 20.4700 \cos \omega \cos \odot \\ D = & - 20.4700 \sin \odot \\ E = & - 0.0421 \sin \Omega + 0''.0005 \sin 2 \Omega - 0''.0031 \sin 2 L \end{aligned}$$

BESSEL'S Star-Constants.

$$\begin{aligned} a &= 3''.072\ 52 + 1''.336\ 40 \sin a_0 \tan \delta_0 = \text{precession in right ascension} \\ b &= \frac{1}{15} \cos a_0 \tan \delta_0 \\ c &= \frac{1}{15} \cos a_0 \sec \delta_0 \\ d &= \frac{1}{15} \sin a_0 \sec \delta_0 \\ a' &= 20''.0460 \cos a_0 = \text{precession in declination} \\ b' &= -\sin a_0 \\ c' &= \tan \omega \cos \delta_0 - \sin a_0 \sin \delta_0 \\ d' &= \cos a_0 \sin \delta_0 \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned} a &= a_0 + \tau \mu + A a + B b + C c + D d + \frac{1}{15} E & (\text{in time}) \\ \delta &= \delta_0 + \tau \mu' + A a' + B b' + C c' + D d' & (\text{in arc}) \end{aligned}$$

INDEPENDENT STAR-NUMBERS.

$$\begin{aligned} f &= f' + f'' = + 46''.0878 A + E \text{ (in arc)} = 3''.072\ 52 A + \frac{1}{15} E & (\text{in time}) \\ f' &= - 0''.0124 \sin 2 \zeta + 0''.0041 \sin (\zeta - \Gamma') + 0''.0007 \sin (\zeta + \Gamma') \\ & - 0''.0021 \sin (2 \zeta - \Omega) - 0''.0016 \sin (3 \zeta - \Gamma') \\ & + 0''.0009 \sin (\zeta - 2 L + \Gamma') + 0''.0004 \sin 2 (\zeta - L) \\ g \sin G &= B & h \sin H &= C \\ g \cos G &= 20''.0460 A & h \cos H &= D & i &= C \tan \omega \end{aligned}$$

Reduction to Apparent Position.

$$\begin{aligned} a &= a_0 + f + \tau \mu + \frac{1}{15} g \sin (G + a_0) \tan \delta_0 + \frac{1}{15} h \sin (H + a_0) \sec \delta_0 & (\text{in time}) \\ \delta &= \delta_0 + \tau \mu' + g \cos (G + a_0) + h \cos (H + a_0) \sin \delta_0 + i \cos \delta_0 & (\text{in arc}) \end{aligned}$$

NOTES.—(1) The independent star-numbers are more convenient, when only one or two apparent positions of a star are required, or when BESSEL'S star-constants are not known with sufficient accuracy. Otherwise, the Besselian star-numbers are more convenient.

(2) In using the star-constants of the *British Association Catalogue*,  $a, b, c, d, a', b', c', d'$ , with the star-numbers of this Ephemeris, the quantities to be formed are  $Ac, Bd, Ca, Db, -Ac', -Bd', -Ca', -Db'$ .

(CONSTANTS OF PARIS CONFERENCE.)

## FOR GREENWICH MEAN NOON.

Date.	Precession in Longitude from 1910.0.	Nutation.			Obliquity of Ecliptic. ( <i>Newcomb</i> .)		The Sun's Aberration.
		In Longitude.	In R. A.	In Obliquity.			
Jan. 0	— 0.10	— 15.15	— 0.926	+ 3.30	23 27	6.88	— 20.82
10	+ 1.28	14.67	0.897	3.47		7.04	20.81
20	2.65	14.28	0.873	3.69		7.25	20.80
30	4.03	14.03	0.858	3.96		7.50	20.78
Feb. 9	5.41	13.94	0.853	4.23		7.76	20.74
19	+ 6.78	— 14.01	— 0.857	+ 4.48	23 27	8.00	— 20.70
Mar. 1	8.16	14.20	0.868	4.70		8.21	20.65
11	9.53	14.50	0.886	4.88		8.37	20.60
21	10.91	14.84	0.908	5.00		8.47	20.54
31	12.28	15.19	0.929	5.05		8.50	20.48
Apr. 10	+ 13.66	— 15.48	— 0.947	+ 5.02	23 27	8.47	— 20.43
20	15.04	15.69	0.959	4.94		8.38	20.37
30	16.41	15.78	0.964	4.84		8.27	20.32
May 10	17.79	15.71	0.961	4.73		8.14	20.27
20	19.16	15.50	0.949	4.63		8.03	20.22
30	+ 20.54	— 15.18	— 0.929	+ 4.56	23 27	7.95	— 20.19
June 9	21.91	14.78	0.904	4.54		7.91	20.16
19	23.29	14.32	0.876	4.56		7.93	20.14
29	24.67	13.84	0.847	4.64		7.99	20.13
July 9	26.04	13.39	0.819	4.78		8.11	20.13
19	+ 27.42	— 13.02	— 0.796	+ 4.96	23 27	8.28	— 20.14
29	28.79	12.75	0.779	5.19		8.50	20.16
Aug. 8	30.17	12.61	0.770	5.44		8.73	20.19
18	31.55	12.60	0.770	5.68		8.96	20.23
28	32.92	12.72	0.778	5.90		9.17	20.27
Sept. 7	+ 34.30	— 12.94	— 0.792	+ 6.09	23 27	9.35	— 20.32
17	35.67	13.24	0.810	6.22		9.48	20.37
27	37.05	13.57	0.830	6.31		9.54	20.43
Oct. 7	38.42	13.89	0.849	6.31		9.53	20.49
17	39.80	14.13	0.864	6.26		9.46	20.55
27	+ 41.18	— 14.27	— 0.872	+ 6.16	23 27	9.35	— 20.60
Nov. 6	42.55	14.26	0.872	6.04		9.22	20.65
16	43.93	14.08	0.862	5.91		9.08	20.70
26	45.30	13.76	0.842	5.80		8.96	20.75
Dec. 6	46.68	13.31	0.813	5.73		8.88	20.78
16	+ 48.05	— 12.77	— 0.780	+ 5.72	23 27	8.85	— 20.80
26	49.44	12.18	0.745	5.77		8.89	20.82
36	+ 50.81	— 11.62	— 0.711	+ 5.86	23 27	8.98	— 20.82

Mean Obliquity, 1910.0 23° 27' 3''.58 (*Newcomb*).

Precession for 1910 . . . . . 50.2586 log = 1.70121

Precession in a Solar Day . . . . . 0.1376 log = 9.13862

Precession in a Sidereal Day . . . . . 0.1372 log = 9.13743

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Jan. 0	-9.47201	-0.5299	-0.51035	+1.30456	Feb. 15	-9.19173	-0.6450	-1.19565	+1.05103
1	9.46906	0.5343	0.55231	1.30314	16	9.18264	0.6426	1.20058	1.03917
2	9.46642	0.5368	0.59045	1.30157	17	9.17075	0.6413	1.20532	1.02685
3	9.46371	0.5375	0.62538	1.29986	18	9.15702	0.6419	1.20988	1.01403
4	9.46051	0.5365	0.65758	1.29801	19	9.14286	0.6447	1.21425	1.00069
h (7.0) 5	-9.45645	-0.5343	-0.68744	+1.29601	h (10.0) 20	-9.12975	-0.6494	-1.21844	+0.98679
6	9.45123	0.5315	0.71524	1.29386	21	9.11889	0.6553	1.22246	0.97231
7	9.44470	0.5289	0.74124	1.29156	22	9.11089	0.6615	1.22631	0.95720
8	9.43688	0.5276	0.76565	1.28911	23	9.10571	0.6672	1.22999	0.94141
9	9.42805	0.5285	0.78862	1.28651	24	9.10280	0.6719	1.23351	0.92489
10	-9.41877	-0.5321	-0.81031	+1.28376	25	-9.10127	-0.6752	-1.23686	+0.90759
11	9.40985	0.5383	0.83083	1.28085	26	9.10019	0.6769	1.24005	0.88944
12	9.40204	0.5464	0.85029	1.27778	27	9.09856	0.6772	1.24309	0.87036
13	9.39587	0.5551	0.86878	1.27456	28	9.09552	0.6763	1.24597	0.85028
14	9.39146	0.5630	0.88639	1.27117	Mar. 1	9.09036	0.6747	1.24870	0.82910
15	-9.38842	-0.5688	-0.90317	+1.26761	2	-9.08250	-0.6728	-1.25128	+0.80670
16	9.38598	0.5718	0.91919	1.26389	3	9.07166	0.6712	1.25371	0.78295
17	9.38313	0.5720	0.93451	1.26000	4	9.05801	0.6707	1.25599	0.75769
18	9.37894	0.5700	0.94917	1.25594	5	9.04234	0.6718	1.25813	0.73074
19	9.37282	0.5670	0.96321	1.25170	6	9.02600	0.6748	1.26013	0.70189
h (8.0) 20	-9.36463	-0.5645	-0.97668	+1.24729	h (11.0) 7	-9.01077	-0.6794	-1.26198	+0.67086
21	9.35480	0.5637	0.98960	1.24269	8	8.99848	0.6850	1.26370	0.63731
22	9.34408	0.5654	1.00202	1.23790	9	8.99032	0.6907	1.26527	0.60083
23	9.33343	0.5697	1.01395	1.23293	10	8.98628	0.6954	1.26670	0.56085
24	9.32373	0.5760	1.02543	1.22776	11	8.98502	0.6982	1.26800	0.51672
25	-9.31559	-0.5835	-1.03648	+1.22238	12	-8.98437	-0.6988	-1.26917	+0.46746
26	9.30929	0.5911	1.04712	1.21681	13	8.98190	0.6973	1.27020	0.41179
27	9.30468	0.5979	1.05737	1.21103	14	8.97554	0.6944	1.27109	0.34779
28	9.30138	0.6034	1.06725	1.20503	15	8.96410	0.6909	1.27185	0.27261
29	9.29883	0.6073	1.07677	1.19881	16	8.94758	0.6880	1.27248	0.18154
30	-9.29640	-0.6095	-1.08595	+1.19236	17	-8.92710	-0.6866	-1.27297	+0.06606
31	9.29345	0.6102	1.09481	1.18568	18	8.90468	0.6871	1.27333	9.90824
Feb. 1	9.28941	0.6096	1.10335	1.17875	19	8.88287	0.6895	1.27357	9.65780
2	9.28389	0.6082	1.11159	1.17158	20	8.86412	0.6933	1.27367	+9.00045
3	9.27658	0.6069	1.11954	1.16415	21	8.85012	0.6976	1.27364	-9.40548
h (9.0) 4	-9.26734	-0.6063	-1.12722	+1.15646	h (12.0) 22	-8.84136	-0.7017	-1.27348	-9.78431
5	9.25644	0.6072	1.13463	1.14849	23	8.83707	0.7049	1.27320	9.98334
6	9.24456	0.6102	1.14178	1.14023	24	8.83569	0.7069	1.27278	0.11914
7	9.23274	0.6154	1.14868	1.13168	25	8.83540	0.7075	1.27223	0.22229
8	9.22215	0.6223	1.15533	1.12282	26	8.83441	0.7068	1.27155	0.30543
9	-9.21376	-0.6300	-1.16174	+1.11365	27	-8.83104	-0.7048	-1.27074	-0.37503
10	9.20811	0.6374	1.16793	1.10414	28	8.82387	0.7019	1.26980	0.43487
11	9.20491	0.6434	1.17389	1.09428	29	8.81171	0.6986	1.26873	0.48731
12	9.20308	0.6471	1.17964	1.08406	30	8.79380	0.6955	1.26753	0.53395
13	9.20116	0.6482	1.18518	1.07345	31	8.76997	0.6931	1.26620	0.57593
14	-9.19774	-0.6472	-1.19052	+1.06245	Apr. 1	-8.74084	-0.6921	-1.26473	-0.61407
15	-9.19173	-0.6450	-1.19565	+1.05103	2	-8.70817	-0.6928	-1.26313	-0.64899

E = - 0".03 = - 0".002



# BESSELIAN STAR-NUMBERS, 1910.

527

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Apr. 1	-8.74084	-0.6921	-1.26473	-0.61407	May 17	+8.84273	-0.6743	-1.01689	-1.23164
2	8.70817	0.6928	1.26313	0.64899	18	8.85034	0.6746	1.00571	1.23640
3	8.67504	0.6953	1.26140	0.68118	19	8.85772	0.6734	0.99412	1.24099
4	8.64552	0.6990	1.25953	0.71102	20	8.86658	0.6708	0.98209	1.24541
5	8.62346	0.7030	1.25752	0.73880	21	8.87814	0.6671	0.96959	1.24966
<sup>h</sup> (13.0) 6	-8.61035	-0.7065	-1.25538	-0.76477	<sup>h</sup> (16.0) 22	+8.89315	-0.6628	-0.95661	-1.25374
7	8.60457	0.7085	1.25310	0.78915	23	8.91172	0.6583	0.94310	1.25767
8	8.60173	0.7084	1.25069	0.81210	24	8.93334	0.6543	0.92904	1.26144
9	8.59594	0.7062	1.24813	0.83376	25	8.95694	0.6515	0.91439	1.26505
10	8.58115	0.7022	1.24543	0.85426	26	8.98105	0.6505	0.89910	1.26851
11	-8.55289	-0.6973	-1.24258	-0.87370	27	+9.00386	-0.6515	-0.88313	-1.27182
12	8.50840	0.6927	1.23959	0.89218	28	9.02379	0.6543	0.86643	1.27498
13	8.44654	0.6893	1.23646	0.90977	29	9.03977	0.6583	0.84894	1.27800
14	8.36773	0.6877	1.23317	0.92654	30	9.05150	0.6624	0.83060	1.28088
15	8.27485	0.6881	1.22974	0.94256	31	9.05952	0.6656	0.81133	1.28362
16	-8.17493	-0.6902	-1.22615	-0.95788	June 1	+9.06524	-0.6670	-0.79104	-1.28622
17	8.07806	0.6932	1.22241	0.97254	2	9.07067	0.6661	0.76963	1.28868
18	7.99564	0.6962	1.21850	0.98659	3	9.07784	0.6630	0.74698	1.29101
19	7.93651	0.6986	1.21444	1.00007	4	9.08824	0.6584	0.72296	1.29320
20	7.89932	0.6999	1.21022	1.01302	5	9.10238	0.6533	0.69742	1.29527
<sup>h</sup> (14.0) 21	-7.87274	-0.6998	-1.20583	-1.02546	<sup>h</sup> (17.0) 6	+9.11968	-0.6489	-0.67016	-1.29720
22	7.83948	0.6982	1.20127	1.03742	7	9.13869	0.6462	0.64095	1.29900
23	7.77960	0.6953	1.19654	1.04894	8	9.15758	0.6458	0.60951	1.30067
24	7.66090	0.6915	1.19163	1.06003	9	9.17473	0.6477	0.57549	1.30222
25	-7.38561	0.6872	1.18654	1.07072	10	9.18910	0.6513	0.53846	1.30364
26	+6.69020	-0.6828	-1.18127	-1.08102	11	+9.20033	-0.6557	-0.49786	-1.30493
27	7.61700	0.6790	1.17581	1.09095	12	9.20866	0.6599	0.45294	1.30610
28	7.92247	0.6765	1.17016	1.10054	13	9.21475	0.6631	0.40271	1.30715
29	8.10992	0.6757	1.16430	1.10980	14	9.21947	0.6650	0.34578	1.30807
30	8.23780	0.6768	1.15825	1.11873	15	9.22373	0.6654	0.28013	1.30887
May 1	+8.32572	-0.6794	-1.15198	-1.12736	16	+9.22834	-0.6643	-0.20263	-1.30955
2	8.38382	0.6828	1.14550	1.13570	17	9.23398	0.6620	0.10810	1.31010
3	8.41979	0.6860	1.13880	1.14375	18	9.24110	0.6590	0.98698	1.31054
4	8.44091	0.6880	1.13187	1.15153	19	9.24990	0.6558	0.81828	1.31085
5	8.45484	0.6880	1.12470	1.15905	20	9.26029	0.6529	0.53853	1.31104
<sup>h</sup> (15.0) 6	+8.47012	-0.6858	-1.11729	-1.16631	<sup>h</sup> (18.0) 21	+9.27193	-0.6511	-8.51844	-1.31112
7	8.49429	0.6816	1.10962	1.17334	22	9.28425	0.6509	+9.44644	1.31107
8	8.53097	0.6761	1.10170	1.18013	23	9.29647	0.6527	9.77229	1.31090
9	8.57807	0.6705	1.09351	1.18669	24	9.30771	0.6563	9.95627	1.31061
10	8.63053	0.6659	1.08504	1.19302	25	9.31719	0.6613	0.08500	1.31020
11	+8.68242	-0.6631	-1.07628	-1.19914	26	+9.32449	-0.6668	+0.18407	-1.30967
12	8.72888	0.6626	1.06721	1.20505	27	9.32966	0.6718	0.26458	1.30902
13	8.76723	0.6640	1.05783	1.21075	28	9.33327	0.6752	0.33238	1.30825
14	8.79678	0.6667	1.04813	1.21626	29	9.33626	0.6765	0.39091	1.30736
15	8.81813	0.6699	1.03808	1.22157	30	9.33975	0.6756	0.44237	1.30634
16	+8.83276	-0.6726	-1.02767	-1.22670	July 1	+9.34475	-0.6729	+0.48827	-1.30520
17	+8.84273	-0.6743	-1.01689	-1.23164	2	+9.35183	-0.6693	+0.52967	-1.30394

E = - 0".04 = - 0".003

[Eph 10]

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)		Log A.	Log B.	Log C.	Log D.
July	1	+9.34475	-0.6729	+0.48827	-1.30520	Aug.	16	+9.57275	-0.7440	+1.17837	-1.08638
	2	9.35183	0.6693	0.52967	1.30394		17	9.57784	0.7472	1.18369	1.07638
	3	9.36096	0.6661	0.56736	1.30255		18	9.58235	0.7518	1.18882	1.06602
	4	9.37155	0.6644	0.60193	1.30104		19	9.58592	0.7572	1.19377	1.05528
	5	9.38263	0.6647	0.63384	1.29940		20	9.58835	0.7625	1.19855	1.04414
h	6	+9.39319	-0.6673	+0.66345	-1.29764	(22.0)	21	+9.58972	-0.7670	+1.20316	-1.03257
(19.0)	7	9.40242	0.6718	0.69106	1.29574		22	9.59036	0.7701	1.20760	1.02056
	8	9.40983	0.6773	0.71690	1.29372		23	9.59082	0.7714	1.21187	1.00807
	9	9.41539	0.6828	0.74118	1.29157		24	9.59170	0.7708	1.21599	0.99508
	10	9.41943	0.6876	0.76406	1.28928		25	9.59354	0.7689	1.21994	0.98155
	11	+9.42241	-0.6912	+0.78568	-1.28686		26	+9.59658	-0.7666	+1.22374	-0.96745
	12	9.42491	0.6933	0.80616	1.28431		27	9.60074	0.7649	1.22739	0.95274
	13	9.42745	0.6939	0.82560	1.28162		28	9.60566	0.7644	1.23088	0.93738
	14	9.43049	0.6934	0.84409	1.27879		29	9.61075	0.7657	1.23423	0.92133
	15	9.43438	0.6920	0.86172	1.27583		30	9.61542	0.7687	1.23743	0.90451
	16	+9.43929	-0.6903	+0.87854	-1.27272		31	+9.61924	-0.7730	+1.24048	-0.88688
	17	9.44528	0.6887	0.89462	1.26947	Sept.	1	9.62201	0.7777	1.24339	0.86837
	18	9.45223	0.6879	0.91000	1.26607		2	9.62370	0.7821	1.24616	0.84889
	19	9.45980	0.6885	0.92475	1.26252		3	9.62458	0.7857	1.24879	0.82836
	20	9.46753	0.6907	0.93890	1.25882	h	4	9.62498	0.7881	1.25128	0.80667
h	21	+9.47486	-0.6947	+0.95249	-1.25497	(23.0)	5	+9.62523	-0.7892	+1.25364	-0.78369
(20.0)	22	9.48123	0.7001	0.96555	1.25096		6	9.62565	0.7891	1.25586	0.75928
	23	9.48621	0.7062	0.97811	1.24679		7	9.62653	0.7881	1.25794	0.73328
	24	9.48972	0.7120	0.99021	1.24246		8	9.62803	0.7865	1.25990	0.70548
	25	9.49196	0.7167	1.00186	1.23796		9	9.63021	0.7848	1.26172	0.67562
	26	+9.49350	-0.7196	+1.01310	-1.23329		10	+9.63307	-0.7834	+1.26340	-0.64341
	27	9.49507	0.7203	1.02393	1.22845		11	9.63651	0.7827	1.26496	0.60847
	28	9.49741	0.7192	1.03439	1.22343		12	9.64030	0.7831	1.26639	0.57031
	29	9.50109	0.7170	1.04449	1.21823		13	9.64414	0.7848	1.26769	0.52831
	30	9.50630	0.7148	1.05424	1.21284		14	9.64765	0.7877	1.26886	0.48165
	31	+9.51276	-0.7135	+1.06366	-1.20726		15	+9.65051	-0.7916	+1.26990	-0.42920
Aug.	1	9.51989	0.7139	1.07277	1.20148		16	9.65247	0.7958	1.27081	0.36937
	2	9.52696	0.7164	1.08158	1.19549		17	9.65350	0.7994	1.27160	0.29976
	3	9.53328	0.7207	1.09009	1.18930		18	9.65386	0.8019	1.27226	0.21662
	4	9.53844	0.7261	1.09832	1.18289		19	9.65392	0.8027	1.27280	0.11349
h	5	+9.54225	-0.7318	+1.10628	-1.17626	h	20	+9.65420	-0.8017	+1.27321	-9.97771
(21.0)	6	9.54483	0.7370	1.11398	1.16941	(0.0)	21	9.65521	0.7993	1.27349	9.77874
	7	9.54649	0.7411	1.12143	1.16232		22	9.65723	0.7962	1.27364	-9.40014
	8	9.54769	0.7439	1.12864	1.15498		23	9.66032	0.7933	1.27367	+8.99373
	9	9.54881	0.7453	1.13561	1.14739		24	9.66420	0.7914	1.27357	9.65186
	10	+9.55018	-0.7455	+1.14235	-1.13954		25	+9.66842	-0.7910	+1.27334	+9.90241
	11	9.55213	0.7448	1.14887	1.13143		26	9.67243	0.7922	1.27299	0.66027
	12	9.55485	0.7437	1.15518	1.12303		27	9.67582	0.7948	1.27251	0.17578
	13	9.55838	0.7426	1.16128	1.11434		28	9.67832	0.7982	1.27190	0.26687
	14	9.56267	0.7420	1.16717	1.10534		29	9.67989	0.8015	1.27116	0.34206
	15	+9.56756	-0.7423	+1.17287	-1.09602		30	+9.68068	-0.8041	+1.27029	+0.40607
	16	+9.57275	-0.7440	+1.17837	-1.08638	Oct.	1	+9.68093	-0.8057	+1.26928	+0.46177

E = -0".03 = -0".002

# BESSELIAN STAR-NUMBERS, 1910.

529

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hour.)	Log A.	Log B.	Log C.	Log D.
Oct. 1	+9.68093	-0.8057	+1.26928	+0.46177	Nov. 16	+9.77263	-0.7685	+1.04301	+1.21901
2	9.68101	0.8060	1.26815	0.51103	17	9.77621	0.7642	1.03230	1.22447
3	9.68121	0.8051	1.26689	0.55518	18	9.78035	0.7613	1.02117	1.22972
4	9.68177	0.8032	1.26549	0.59516	19	9.78464	0.7603	1.00961	1.23478
5	9.68288	0.8006	1.26396	0.63167	20	9.78865	0.7611	0.99758	1.23965
<sup>h</sup> (1.0) 6	+9.68462	-0.7978	+1.26229	+0.66524	<sup>h</sup> (4.0) 21	+9.79206	-0.7632	+0.98507	+1.24434
7	9.68699	0.7951	1.26048	0.69630	22	9.79473	0.7659	0.97204	1.24885
8	9.68990	0.7930	1.25854	0.72518	23	9.79666	0.7685	0.95847	1.25318
9	9.69319	0.7918	1.25646	0.75215	24	9.79801	0.7702	0.94431	1.25733
10	9.69664	0.7919	1.25424	0.77744	25	9.79903	0.7706	0.92952	1.26131
11	+9.69992	-0.7933	+1.25187	+0.80122	26	+9.80001	-0.7696	+0.91407	+1.26512
12	9.70272	0.7957	1.24936	0.82365	27	9.80120	0.7675	0.89790	1.26877
13	9.70481	0.7986	1.24670	0.84487	28	9.80275	0.7645	0.88095	1.27225
14	9.70613	0.8013	1.24389	0.86498	29	9.80476	0.7610	0.86317	1.27557
15	9.70679	0.8031	1.24094	0.88409	30	9.80726	0.7575	0.84448	1.27873
16	+9.70710	-0.8034	+1.23783	+0.90228	Dec. 1	+9.81021	-0.7544	+0.82480	+1.28174
17	9.70751	0.8019	1.23456	0.91962	2	9.81352	0.7523	0.80404	1.28459
18	9.70847	0.7988	1.23114	0.93618	3	9.81703	0.7514	0.78209	1.28728
19	9.71029	0.7947	1.22756	0.95202	4	9.82053	0.7520	0.75882	1.28983
20	9.71308	0.7905	1.22381	0.96718	5	9.82379	0.7539	0.73407	1.29222
<sup>h</sup> (2.0) 21	+9.71670	-0.7870	+1.21990	+0.98171	<sup>h</sup> (5.0) 6	+9.82660	-0.7569	+0.70768	+1.29447
22	9.72078	0.7850	1.21581	0.99565	7	9.82883	0.7603	0.67943	1.29657
23	9.72487	0.7847	1.21155	1.00904	8	9.83047	0.7632	0.64907	1.29853
24	9.72853	0.7860	1.20712	1.02191	9	9.83168	0.7650	0.61627	1.30034
25	9.73144	0.7883	1.20250	1.03429	10	9.83273	0.7650	0.58063	1.30200
26	+9.73349	-0.7908	+1.19769	+1.04620	11	+9.83397	-0.7632	+0.54165	+1.30353
27	9.73478	0.7929	1.19269	1.05768	12	9.83572	0.7600	0.49867	1.30491
28	9.73551	0.7940	1.18750	1.06874	13	9.83818	0.7560	0.45080	1.30615
29	9.73601	0.7938	1.18212	1.07940	14	9.84138	0.7523	0.39683	1.30725
30	9.73655	0.7924	1.17653	1.08968	15	9.84517	0.7498	0.33501	1.30822
31	+9.73739	-0.7898	+1.17073	+1.09960	16	+9.84922	-0.7491	+0.26275	+1.30904
Nov. 1	9.73870	0.7865	1.16471	1.10918	17	9.85314	0.7504	0.17581	1.30973
2	9.74057	0.7828	1.15847	1.11842	18	9.85662	0.7533	0.06681	1.31028
3	9.74301	0.7791	1.15200	1.12734	19	9.85947	0.7572	0.92072	1.31069
4	9.74596	0.7760	1.14529	1.13596	20	9.86165	0.7611	0.69866	1.31096
<sup>h</sup> (3.0) 5	+9.74930	-0.7738	+1.13834	+1.14428	<sup>h</sup> (6.0) 21	+9.86325	-0.7643	+0.21989	+1.31110
6	9.75282	0.7728	1.13114	1.15232	22	9.86446	0.7664	-0.22515	1.31110
7	9.75627	0.7732	1.12367	1.16009	23	9.86553	0.7671	0.70052	1.31096
8	9.75938	0.7749	1.11594	1.16759	24	9.86669	0.7665	0.92197	1.31069
9	9.76193	0.7773	1.10793	1.17483	25	9.86810	0.7649	0.06784	1.31027
10	+9.76381	-0.7798	+1.09963	+1.18183	26	+9.86988	-0.7627	-0.17676	+1.30972
11	9.76508	0.7816	1.09103	1.18859	27	9.87206	0.7604	0.26365	1.30903
12	9.76594	0.7820	1.08211	1.19511	28	9.87464	0.7585	0.33593	1.30820
13	9.76676	0.7807	1.07286	1.20141	29	9.87753	0.7574	0.39775	1.30724
14	9.76796	0.7776	1.06327	1.20749	30	9.88062	0.7575	0.45174	1.30613
15	+9.76986	-0.7733	+1.05333	+1.21335	31	+9.88374	-0.7590	-0.49964	+1.30488
16	+9.77263	-0.7685	+1.04301	+1.21901	32	+9.88672	-0.7619	-0.54265	+1.30349

E = - 0".03 = - 0".002

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f'$	$f''$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .		
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
	y	s	s	°	h m	°	h m			"			
Jan.	0	-0.0001	-0.925	+0.011	209 41.1	13 58.7	350 52.5	23 23.5	+0.83514	+1.31009	-1.40	-0.1476	
	1	+0.0027	0.913	+0.006	210 6.1	14 0.4	349 56.1	23 19.7	0.83401	1.30987	1.55	0.1896	
	2	0.0054	0.902	0.000	210 23.9	14 1.6	348 59.6	23 16.0	0.83268	1.30963	1.69	0.2278	
	3	0.0082	0.890	-0.006	210 35.7	14 2.4	348 3.1	23 12.2	0.83084	1.30937	1.83	0.2627	
	h (7.0)	4	0.0109	0.879	0.011	210 43.4	14 2.9	347 6.5	23 8.4	0.82822	1.30909	1.97	0.2949
	5	0.0136	-0.867	-0.014	210 49.8	14 3.3	346 9.9	23 4.7	+0.82465	+1.30879	-2.11	-0.3248	
	6	0.0164	0.856	0.015	210 58.1	14 3.9	345 13.1	23 0.9	0.82005	1.30847	2.25	0.3526	
	7	0.0191	0.845	0.013	211 12.0	14 4.8	344 16.3	22 57.1	0.81458	1.30813	2.39	0.3786	
	8	0.0218	0.834	0.009	211 35.0	14 6.3	343 19.3	22 53.3	0.80853	1.30778	2.53	0.4030	
	9	0.0246	0.822	-0.003	212 9.4	14 8.6	342 22.3	22 49.5	0.80240	1.30740	2.67	0.4259	
	10	0.0273	-0.811	+0.003	212 55.5	14 11.7	341 25.2	22 45.7	+0.79684	+1.30701	-2.80	-0.4476	
	11	0.0301	0.800	0.008	213 50.7	14 15.4	340 27.9	22 41.9	0.79249	1.30660	2.94	0.4681	
	12	0.0328	0.789	0.012	214 49.2	14 19.3	339 30.6	22 38.0	0.78975	1.30617	3.07	0.4876	
	13	0.0355	0.778	0.012	215 44.7	14 23.0	338 33.2	22 34.2	0.78855	1.30572	3.21	0.5061	
	14	0.0383	0.768	0.008	216 31.1	14 26.1	337 35.6	22 30.4	0.78841	1.30526	3.34	0.5237	
	15	0.0410	-0.757	+0.002	217 4.7	14 28.3	336 37.9	22 26.5	+0.78855	+1.30478	-3.47	-0.5405	
	16	0.0438	0.746	-0.004	217 25.5	14 29.7	335 40.2	22 22.7	0.78811	1.30429	3.60	0.5565	
	17	0.0465	0.736	0.009	217 37.1	14 30.5	334 42.3	22 18.8	0.78638	1.30378	3.73	0.5718	
	18	0.0492	0.725	0.012	217 45.4	14 31.0	333 44.2	22 14.9	0.78300	1.30326	3.86	0.5865	
	h (8.0)	19	0.0520	0.715	0.013	217 57.4	14 31.8	332 46.1	22 11.1	0.77806	1.30272	3.99	0.6005
	20	0.0547	-0.704	-0.010	218 19.2	14 33.3	331 47.8	22 7.2	+0.77203	+1.30218	-4.11	-0.6140	
	21	0.0574	0.694	-0.004	218 54.1	14 35.6	330 49.4	22 3.3	0.76572	1.30162	4.24	0.6269	
	22	0.0602	0.684	+0.003	219 42.2	14 38.8	329 50.8	21 59.4	0.75998	1.30104	4.36	0.6393	
	23	0.0629	0.674	0.009	220 40.6	14 42.7	328 52.1	21 55.5	0.75556	1.30046	4.48	0.6513	
	24	0.0657	0.664	0.014	221 43.5	14 46.9	327 53.3	21 51.6	0.75282	1.29987	4.60	0.6628	
	25	0.0684	-0.654	+0.016	222 45.0	14 51.0	326 54.3	21 47.6	+0.75176	+1.29926	-4.72	-0.6738	
	26	0.0711	0.644	0.015	223 39.9	14 54.7	325 55.2	21 43.7	0.75197	1.29865	4.84	0.6844	
	27	0.0739	0.634	0.012	224 25.2	14 57.7	324 55.9	21 39.7	0.75288	1.29803	4.95	0.6947	
	28	0.0766	0.625	0.007	225 0.0	15 0.0	323 56.4	21 35.8	0.75393	1.29740	5.06	0.7046	
	29	0.0794	0.615	+0.001	225 25.4	15 1.7	322 56.8	21 31.8	0.75461	1.29676	5.18	0.7141	
	30	0.0821	-0.606	-0.005	225 43.7	15 2.9	321 57.0	21 27.8	+0.75454	+1.29612	-5.29	-0.7233	
31	0.0848	0.596	0.010	225 58.0	15 3.9	320 57.1	21 23.8	0.75345	1.29548	5.40	0.7321		
Feb.	1	0.0876	0.587	0.014	226 11.7	15 4.8	319 57.0	21 19.8	0.75121	1.29482	5.50	0.7406	
	2	0.0903	0.578	0.015	226 28.3	15 5.9	318 56.7	21 15.8	0.74789	1.29417	5.61	0.7489	
	h (9.0)	3	0.0930	0.569	0.014	226 51.9	15 7.5	317 56.2	21 11.7	0.74372	1.29351	5.71	0.7568
	4	0.0958	-0.560	-0.011	227 26.0	15 9.7	316 55.6	21 7.7	+0.73913	+1.29285	-5.81	-0.7645	
	5	0.0985	0.551	-0.006	228 12.5	15 12.8	315 54.8	21 3.7	0.73472	1.29219	5.91	0.7719	
	6	0.1012	0.542	0.000	229 10.8	15 16.7	314 53.9	20 59.6	0.73122	1.29152	6.01	0.7791	
	7	0.1040	0.534	+0.006	230 17.2	15 21.1	313 52.8	20 55.5	0.72929	1.29086	6.11	0.7860	
	8	0.1067	0.525	0.010	231 25.1	15 25.7	312 51.5	20 51.4	0.72924	1.29020	6.20	0.7926	
	9	0.1095	-0.517	+0.012	232 27.1	15 29.8	311 50.0	20 47.3	+0.73086	+1.28954	-6.30	-0.7990	
	10	0.1122	0.508	0.010	233 16.9	15 33.1	310 48.4	20 43.2	0.73350	1.28888	6.39	0.8052	
	11	0.1149	0.500	+0.005	233 51.5	15 35.4	309 46.6	20 39.1	0.73620	1.28823	6.47	0.8112	
	12	0.1177	0.492	-0.001	234 12.0	15 36.8	308 44.7	20 35.0	0.73798	1.28758	6.56	0.8170	
	13	0.1204	0.484	0.007	234 23.4	15 37.6	307 42.7	20 30.8	0.73810	1.28694	6.65	0.8225	
	14	0.1232	-0.476	-0.011	234 32.7	15 38.2	306 40.4	20 26.7	+0.73629	+1.28630	-6.73	-0.8278	
	15	0.1259	-0.468	-0.012	234 46.7	15 39.1	305 37.9	20 22.5	+0.73277	+1.28568	-6.81	-0.8330	

## INDEPENDENT STAR-NUMBERS, 1910.

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(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f'$		$f''$		$G$		$H$		Log $\kappa$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	$y$	$s$	$s$	$o$	$h$	$m$	$o$	$h$	$m$				
Feb.	15	0.1259	-0.468	-0.012	234	46.7	15	305	37.9	+0.73277	+1.28568	-6.81	-0.8330
	16	0.1286	0.460	0.010	235	11.9	15	304	35.4	0.72819	1.28505	6.89	0.8379
	17	0.1314	0.452	-0.005	235	51.0	15	303	32.7	0.72351	1.28444	6.96	0.8426
	18	0.1341	0.445	+0.001	236	43.3	15	302	29.9	0.71971	1.28384	7.03	0.8472
	19	0.1368	0.437	0.008	237	44.3	15	301	26.9	0.71754	1.28324	7.10	0.8516
$h$ (10.0)	20	0.1396	-0.430	+0.013	238	47.3	15	300	23.8	+0.71730	+1.28266	-7.17	-0.8558
	21	0.1423	0.422	0.016	239	45.5	15	299	20.5	0.71880	1.28209	7.24	0.8598
	22	0.1451	0.415	0.016	240	34.1	16	298	17.2	0.72150	1.28151	7.31	0.8636
	23	0.1478	0.408	0.013	241	10.9	16	297	13.7	0.72466	1.28100	7.37	0.8673
	24	0.1505	0.400	0.009	241	36.2	16	296	10.0	0.72761	1.28047	7.43	0.8708
	25	0.1533	-0.393	+0.003	241	52.0	16	295	6.2	+0.72980	+1.27995	-7.49	-0.8742
	26	0.1560	0.386	-0.003	242	1.2	16	294	2.4	0.73090	1.27946	7.54	0.8774
	27	0.1588	0.379	0.009	242	7.4	16	292	58.4	0.73079	1.27898	7.59	0.8804
	28	0.1615	0.372	0.013	242	14.5	16	291	54.2	0.72944	1.27851	7.64	0.8833
Mar.	1	0.1642	0.366	0.015	242	26.0	16	290	50.0	0.72702	1.27807	7.69	0.8860
	2	0.1670	-0.359	-0.015	242	45.2	16	289	45.7	+0.72383	+1.27764	-7.74	-0.8886
	3	0.1697	0.352	0.013	243	14.9	16	288	41.3	0.72036	1.27723	7.78	0.8910
	4	0.1724	0.345	0.008	243	56.3	16	287	36.8	0.71725	1.27685	7.82	0.8933
	5	0.1752	0.339	-0.002	244	48.2	16	286	32.2	0.71524	1.27648	7.86	0.8954
$h$ (11.0)	6	0.1779	0.332	+0.004	245	46.3	16	285	27.5	0.71484	1.27613	7.90	0.8974
	7	0.1806	-0.326	+0.009	246	44.1	16	284	22.8	+0.71623	+1.27581	-7.93	-0.8993
	8	0.1834	0.319	0.011	247	34.8	16	283	18.0	0.71914	1.27550	7.96	0.9010
	9	0.1861	0.313	0.010	248	13.0	16	282	13.1	0.72284	1.27522	7.99	0.9026
	10	0.1889	0.306	0.006	248	36.6	16	281	8.2	0.72636	1.27496	8.02	0.9040
	11	0.1916	0.300	+0.001	248	47.7	16	280	3.2	0.72868	1.27472	8.04	0.9053
	12	0.1943	-0.294	-0.005	248	51.1	16	278	58.3	+0.72914	+1.27451	-8.06	-0.9065
	13	0.1971	0.287	0.010	248	53.6	16	277	53.3	0.72752	1.27432	8.08	0.9075
	14	0.1998	0.281	0.012	249	2.5	16	276	48.3	0.72410	1.27416	8.10	0.9084
	15	0.2026	0.275	0.011	249	23.6	16	275	43.2	0.71961	1.27402	8.11	0.9092
	16	0.2053	0.268	-0.007	249	58.6	16	274	38.2	0.71508	1.27390	8.12	0.9098
	17	0.2080	-0.262	0.000	250	46.2	16	273	33.2	+0.71153	+1.27381	-8.13	-0.9103
	18	0.2108	0.256	+0.007	251	41.7	16	272	28.2	0.70969	1.27374	8.14	0.9106
	19	0.2135	0.250	0.013	252	37.6	16	271	23.2	0.70980	1.27369	8.15	0.9109
	20	0.2162	0.243	0.016	253	27.3	16	270	18.3	0.71162	1.27367	8.15	0.9110
$h$ (12.0)	21	0.2190	0.237	0.017	254	6.2	16	269	13.4	0.71451	1.27368	8.15	0.9110
	22	0.2217	-0.231	+0.015	254	32.6	16	268	8.6	+0.71767	+1.27371	-8.14	-0.9108
	23	0.2245	0.224	0.011	254	47.7	16	267	3.8	0.72039	1.27377	8.14	0.9105
	24	0.2272	0.218	+0.005	254	54.6	16	265	59.0	0.72217	1.27384	8.13	0.9101
	25	0.2299	0.212	-0.001	254	56.4	16	264	54.4	0.72272	1.27394	8.12	0.9095
	26	0.2327	0.206	0.007	254	56.8	16	263	49.8	0.72193	1.27407	8.11	0.9088
	27	0.2354	-0.199	-0.011	254	59.5	17	262	45.3	+0.71985	+1.27422	-8.09	-0.9080
	28	0.2382	0.193	0.014	255	8.0	17	261	40.8	0.71670	1.27440	8.07	0.9071
	29	0.2409	0.187	0.015	255	25.3	17	260	36.4	0.71283	1.27459	8.05	0.9060
	30	0.2436	0.180	0.014	255	53.2	17	259	32.2	0.70879	1.27481	8.03	0.9048
	31	0.2464	0.174	0.010	256	32.6	17	258	28.0	0.70520	1.27505	8.01	0.9035
Apr.	1	0.2491	-0.167	-0.005	257	21.6	17	257	24.0	+0.70277	+1.27532	-7.98	-0.9020
	2	0.2518	-0.161	+0.001	258	16.1	17	256	20.0	+0.70202	+1.27560	-7.95	-0.9004

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f'$		$f''$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .			
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.									
		y	s	s	°	'	h	m	°	'	h	m					
Apr.	1	0.2491	-0.167	-0.005	257	21.6	17	9.4	257	24.0	17	9.6	+0.70277	+1.27532	-7.98	-0.9020	
	2	0.2518	0.161	+0.001	258	16.1	17	13.1	256	20.0	17	5.3	0.70202	1.27560	7.95	0.9004	
	3	0.2546	0.154	0.006	259	10.1	17	16.7	255	16.2	17	1.1	0.70310	1.27591	7.92	0.8987	
	4	0.2573	0.148	0.009	259	56.9	17	19.8	254	12.5	16	56.8	0.70567	1.27624	7.89	0.8968	
	h	5	0.2600	0.141	0.009	260	31.5	17	22.1	253	9.0	16	52.6	0.70899	1.27658	7.85	0.8948
	(13.0)	6	0.2628	-0.134	+0.007	260	52.5	17	23.5	252	5.5	16	48.4	+0.71204	+1.27695	-7.81	-0.8927
	7	0.2655	0.128	+0.002	261	2.0	17	24.1	251	2.2	16	44.1	0.71384	1.27734	7.77	0.8904	
	8	0.2683	0.121	-0.004	261	5.2	17	24.3	249	59.1	16	39.9	0.71367	1.27774	7.73	0.8880	
	9	0.2710	0.114	0.010	261	9.6	17	24.6	248	56.1	16	35.7	0.71134	1.27816	7.68	0.8854	
	10	0.2737	0.107	0.013	261	22.5	17	25.5	247	53.3	16	31.6	0.70711	1.27860	7.63	0.8827	
	11	0.2765	-0.100	-0.012	261	49.3	17	27.3	246	50.7	16	27.4	+0.70176	+1.27906	-7.58	-0.8799	
	12	0.2792	0.093	0.008	262	31.8	17	30.1	245	48.2	16	23.2	0.69640	1.27953	7.53	0.8769	
	13	0.2820	0.086	-0.002	263	27.8	17	33.8	244	45.9	16	19.1	0.69209	1.28002	7.48	0.8738	
	14	0.2847	0.079	+0.005	264	31.2	17	38.1	243	43.7	16	14.9	0.68968	1.28052	7.42	0.8705	
	15	0.2874	0.072	0.011	265	34.3	17	42.3	242	41.8	16	10.8	0.68942	1.28103	7.36	0.8670	
	16	0.2902	-0.065	+0.016	266	29.8	17	46.0	241	40.1	16	6.7	+0.69101	+1.28156	-7.30	-0.8634	
	17	0.2929	0.057	0.018	267	13.0	17	48.9	240	38.5	16	2.6	0.69369	1.28210	7.24	0.8597	
	18	0.2956	0.050	0.017	267	42.8	17	50.9	239	37.1	15	58.5	0.69658	1.28265	7.18	0.8558	
	19	0.2984	0.042	0.013	268	0.9	17	52.1	238	36.0	15	54.4	0.69890	1.28322	7.11	0.8518	
	h	20	0.3011	0.035	0.008	268	10.9	17	52.7	237	35.0	15	50.3	0.70014	1.28379	7.04	0.8475
	(14.0)	21	0.3039	-0.027	+0.002	268	17.4	17	53.1	236	34.2	15	46.3	+0.70000	+1.28437	-6.97	-0.8431
	22	0.3066	0.019	-0.004	268	24.7	17	53.6	235	33.6	15	42.2	0.69838	1.28496	6.90	0.8386	
	23	0.3093	0.012	0.009	268	36.5	17	54.4	234	33.3	15	38.2	0.69547	1.28556	6.82	0.8338	
	24	0.3121	-0.004	0.013	268	55.9	17	55.7	233	33.1	15	34.2	0.69158	1.28617	6.74	0.8289	
	25	0.3148	+0.004	0.014	269	25.6	17	57.7	232	33.1	15	30.2	0.68717	1.28678	6.66	0.8238	
	26	0.3176	+0.012	-0.013	270	6.9	18	0.5	231	33.3	15	26.2	+0.68276	+1.28740	-6.58	-0.8186	
	27	0.3203	0.020	0.010	270	59.7	18	4.0	230	33.7	15	22.2	0.67906	1.28802	6.50	0.8131	
	28	0.3230	0.029	-0.005	272	1.3	18	8.1	229	34.3	15	18.3	0.67676	1.28864	6.42	0.8075	
	29	0.3258	0.037	0.000	273	7.1	18	12.5	228	35.2	15	14.4	0.67636	1.28927	6.33	0.8016	
	30	0.3285	0.045	+0.005	274	10.3	18	16.7	227	36.2	15	10.4	0.67795	1.28990	6.24	0.7956	
	May	1	0.3312	+0.054	+0.009	275	4.4	18	20.3	226	37.4	15	6.5	+0.68113	+1.29054	-6.16	-0.7893
2		0.3340	0.062	0.010	275	45.0	18	23.0	225	38.8	15	2.6	0.68503	1.29117	6.06	0.7828	
3		0.3367	0.071	0.007	276	11.8	18	24.8	224	40.4	14	58.7	0.68860	1.29180	5.97	0.7761	
4		0.3395	0.080	+0.002	276	28.4	18	25.9	223	42.2	14	54.8	0.69083	1.29244	5.88	0.7692	
h		5	0.3422	0.089	-0.004	276	40.9	18	26.7	222	44.2	14	50.9	0.69101	1.29307	5.78	0.7620
(15.0)		6	0.3449	+0.098	-0.009	276	57.3	18	27.8	221	46.3	14	47.1	+0.68901	+1.29370	-5.68	-0.7546
7		0.3477	0.107	0.013	277	25.3	18	29.7	220	48.7	14	43.2	0.68520	1.29433	5.58	0.7469	
8		0.3504	0.116	0.014	278	10.1	18	32.7	219	51.3	14	39.4	0.68051	1.29495	5.48	0.7390	
9		0.3531	0.125	0.011	279	12.3	18	36.8	218	54.0	14	35.6	0.67611	1.29557	5.38	0.7308	
10		0.3559	0.134	-0.005	280	28.3	18	41.9	217	57.0	14	31.8	0.67317	1.29619	5.28	0.7223	
11		0.3586	+0.143	+0.002	281	50.2	18	47.4	217	0.1	14	28.0	+0.67248	+1.29680	-5.17	-0.7136	
12		0.3614	0.153	0.009	283	8.7	18	52.6	216	3.4	14	24.2	0.67413	1.29740	5.06	0.7045	
13		0.3641	0.162	0.015	284	15.9	18	57.1	215	6.9	14	20.5	0.67763	1.29800	4.96	0.6951	
14		0.3668	0.172	0.018	285	8.0	19	0.5	214	10.6	14	16.7	0.68208	1.29859	4.85	0.6854	
15		0.3696	0.181	0.018	285	44.8	19	3.0	213	14.5	14	13.0	0.68654	1.29917	4.74	0.6754	
16		0.3723	+0.191	+0.015	286	9.8	19	4.7	212	18.5	14	9.2	+0.69018	+1.29975	-4.62	-0.6650	
17		0.3750	+0.201	+0.010	286	27.5	19	5.8	211	22.7	14	5.5	+0.69250	+1.30031	-4.51	-0.6542	

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f'$		$f''$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .		
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.								
		y	s	s	°	'	h m	°	'	h m					
May	17	0.3750	+0.201	+0.010	286	27.5	19 5.8	211	22.7	14 5.5	+0.69250	+1.30031	-4.51	-0.6542	
	18	0.3778	0.211	+0.004	286	43.4	19 6.9	210	27.1	14 1.8	0.69336	1.30087	4.40	0.6430	
	19	0.3805	0.221	-0.002	287	2.4	19 8.2	209	31.7	13 58.1	0.69287	1.30141	4.28	0.6314	
	20	0.3833	0.231	0.008	287	28.0	19 9.9	208	36.4	13 54.4	0.69128	1.30195	4.16	0.6194	
	21	0.3860	0.241	0.012	288	2.9	19 12.2	207	41.2	13 50.7	0.68902	1.30247	4.04	0.6069	
	(16.0)	22	0.3887	+0.251	-0.014	288	48.9	19 15.3	206	46.3	13 47.1	+0.68662	+1.30298	-3.93	-0.5939
	23	0.3915	0.262	0.013	289	45.9	19 19.1	205	51.5	13 43.4	0.68465	1.30348	3.81	0.5804	
	24	0.3942	0.272	0.011	290	51.8	19 23.5	204	56.8	13 39.8	0.68377	1.30397	3.68	0.5663	
	25	0.3970	0.282	0.007	292	2.8	19 28.2	204	2.2	13 36.1	0.68454	1.30444	3.56	0.5517	
	26	0.3997	0.293	-0.001	293	13.4	19 32.9	203	7.8	13 32.5	0.68723	1.30490	3.44	0.5364	
	27	0.4024	+0.303	+0.004	294	17.2	19 37.1	202	13.5	13 28.9	+0.69174	+1.30535	-3.32	-0.5204	
	28	0.4052	0.314	0.008	295	8.7	19 40.6	201	19.4	13 25.3	0.69755	1.30578	3.19	0.5037	
	29	0.4079	0.324	0.010	295	45.5	19 43.0	200	25.3	13 21.7	0.70375	1.30620	3.06	0.4862	
	30	0.4106	0.335	0.009	296	9.2	19 44.6	199	31.4	13 18.1	0.70932	1.30660	2.94	0.4679	
	31	0.4134	0.346	+0.004	296	24.4	19 45.6	198	37.6	13 14.5	0.71346	1.30699	2.81	0.4486	
	June	1	0.4161	+0.357	-0.002	296	38.1	19 46.5	197	43.9	13 10.9	+0.71572	+1.30736	-2.68	-0.4283
2		0.4188	0.367	0.008	296	58.2	19 47.9	196	50.3	13 7.4	0.71612	1.30771	2.55	0.4069	
3		0.4216	0.378	0.013	297	31.1	19 50.1	195	56.8	13 3.8	0.71519	1.30805	2.42	0.3843	
4		0.4243	0.389	0.015	298	20.4	19 53.4	195	3.4	13 0.2	0.71384	1.30838	2.29	0.3603	
5		0.4271	0.400	0.014	299	25.0	19 57.7	194	10.1	12 56.7	0.71321	1.30868	2.16	0.3347	
(17.0)		6	0.4298	+0.411	-0.009	300	39.4	20 2.6	193	16.8	12 53.1	+0.71426	+1.30897	-2.03	-0.3075
7		0.4325	0.422	-0.002	301	55.6	20 7.7	192	23.7	12 49.6	0.71743	1.30924	1.90	0.2783	
8		0.4353	0.433	+0.006	303	4.6	20 12.3	191	30.6	12 46.0	0.72261	1.30950	1.77	0.2468	
9		0.4380	0.445	0.013	304	0.1	20 16.0	190	37.6	12 42.5	0.72918	1.30973	1.63	0.2128	
10		0.4408	0.456	0.017	304	39.8	20 18.7	189	44.6	12 39.0	0.73621	1.30995	1.50	0.1758	
11		0.4435	+0.467	+0.018	305	5.3	20 20.4	188	51.8	12 35.5	+0.74281	+1.31015	-1.37	-0.1352	
12		0.4462	0.478	0.016	305	20.8	20 21.4	187	58.9	12 31.9	0.74837	1.31033	1.23	0.0902	
13		0.4490	0.489	0.012	305	31.4	20 22.1	187	6.2	12 28.4	0.75258	1.31049	1.10	0.0400	
14		0.4517	0.500	+0.006	305	42.1	20 22.8	186	13.5	12 24.9	0.75543	1.31064	0.96	0.9831	
15		0.4544	0.512	0.000	305	56.7	20 23.8	185	20.8	12 21.4	0.75711	1.31076	0.83	0.9174	
16		0.4572	+0.523	-0.006	306	18.1	20 25.2	184	28.2	12 17.9	+0.75800	+1.31087	-0.69	-0.8399	
17	0.4599	0.534	0.010	306	47.9	20 27.2	183	35.6	12 14.4	0.75856	1.31096	0.56	0.7454		
18	0.4627	0.546	0.013	307	26.6	20 29.8	182	43.1	12 10.9	0.75924	1.31103	0.42	0.6243		
19	0.4654	0.557	0.013	308	12.8	20 32.9	181	50.6	12 7.4	0.76053	1.31108	0.28	0.4556		
20	0.4681	0.568	0.011	309	3.9	20 36.3	180	58.0	12 3.9	0.76283	1.31111	0.15	0.1758		
(18.0)	21	0.4709	+0.580	-0.007	309	56.4	20 39.8	180	5.5	12 0.4	+0.76646	+1.31112	-0.01	-8.1557	
22	0.4736	0.591	-0.002	310	45.2	20 43.0	179	13.1	11 56.9	0.77152	1.31111	+0.12	+0.0838		
23	0.4764	0.602	+0.004	311	26.2	20 45.7	178	20.6	11 53.4	0.77780	1.31108	0.26	0.9406		
24	0.4791	0.614	0.009	311	56.2	20 47.7	177	28.1	11 49.9	0.78478	1.31104	0.39	0.5936		
25	0.4818	0.625	0.011	312	13.8	20 48.9	176	35.6	11 46.4	0.79178	1.31097	0.53	0.7223		
26	0.4845	+0.636	+0.010	312	20.8	20 49.4	175	43.1	11 42.9	+0.79811	+1.31089	+0.66	+0.8214		
27	0.4873	0.647	0.007	312	21.6	20 49.4	174	50.5	11 39.4	0.80319	1.31079	0.80	0.9019		
28	0.4900	0.659	+0.001	312	22.1	20 49.5	173	57.9	11 35.9	0.80670	1.31067	0.93	0.9697		
29	0.4928	0.670	-0.006	312	28.7	20 49.9	173	5.3	11 32.4	0.80876	1.31053	1.07	0.0282		
30	0.4955	0.681	0.012	312	46.3	20 51.1	172	12.7	11 28.8	0.80986	1.31037	1.20	0.0797		
July	1	0.4982	+0.692	-0.015	313	16.8	20 53.1	171	20.0	11 25.3	+0.81074	+1.31019	+1.33	+0.1256	
	2	0.5010	+0.704	-0.015	313	58.7	20 55.9	170	27.3	11 21.8	+0.81225	+1.30999	+1.47	+0.1670	

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f'$		$f''$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
July (19.0)	y	s	s	°	h m	°	h m	°	h m			"	
	1	0.4982	+0.692	-0.015	313 16.8 20 53.1	171 20.0	11 25.3	+0.81074	+1.31019	+1.33	+0.1256		
	2	0.5010	0.704	0.015	313 58.7 20 55.9	170 27.3	11 21.8	0.81225	1.30999	1.47	0.1670		
	3	0.5037	0.715	0.011	314 47.6 20 59.2	169 34.5	11 18.3	0.81509	1.30978	1.60	0.2047		
	4	0.5065	0.726	-0.005	315 36.4 21 2.4	168 41.6	11 14.8	0.81954	1.30955	1.74	0.2392		
	5	0.5092	0.737	+0.003	316 18.9 21 5.3	167 48.7	11 11.2	0.82544	1.30930	1.87	0.2711		
	6	0.5119	+0.748	+0.010	316 50.2 21 7.3	166 55.7	11 7.7	+0.83225	+1.30904	+2.00	+0.3007		
	7	0.5147	0.759	0.015	317 9.0 21 8.6	166 2.7	11 4.2	0.83925	1.30875	2.13	0.3283		
	8	0.5174	0.770	0.018	317 16.7 21 9.1	165 9.6	11 0.6	0.84576	1.30845	2.26	0.3542		
	9	0.5202	0.781	0.017	317 16.9 21 9.1	164 16.4	10 57.1	0.85131	1.30814	2.39	0.3785		
	10	0.5229	0.792	0.013	317 13.9 21 8.9	163 23.1	10 53.5	0.85570	1.30780	2.52	0.4014		
	11	0.5256	+0.803	+0.008	317 11.6 21 8.8	162 29.8	10 49.9	+0.85895	+1.30745	+2.65	+0.4230		
	12	0.5284	0.813	+0.002	317 13.2 21 8.9	161 36.3	10 46.4	0.86126	1.30708	2.78	0.4435		
	13	0.5311	0.824	-0.004	317 20.6 21 9.4	160 42.8	10 42.9	0.86294	1.30670	2.90	0.4629		
	14	0.5338	0.835	0.009	317 34.9 21 10.3	159 49.2	10 39.3	0.86435	1.30631	3.03	0.4814		
	15	0.5366	0.845	0.012	317 55.6 21 11.7	158 55.5	10 35.7	0.86585	1.30590	3.15	0.4990		
	16	0.5393	+0.856	-0.013	318 21.6 21 13.4	158 1.6	10 32.1	+0.86781	+1.30547	+3.28	+0.5158		
	17	0.5421	0.866	0.012	318 51.1 21 15.4	157 7.7	10 28.5	0.87050	1.30503	3.40	0.5319		
	18	0.5448	0.877	0.009	319 21.4 21 17.4	156 13.6	10 24.9	0.87414	1.30458	3.53	0.5473		
	19	0.5475	0.887	-0.004	319 48.9 21 19.3	155 19.4	10 21.3	0.87876	1.30411	3.65	0.5621		
20	0.5503	0.897	+0.002	320 10.3 21 20.7	154 25.1	10 17.7	0.88422	1.30363	3.77	0.5762			
h (20.0)	21	0.5530	+0.908	+0.007	320 23.3 21 21.6	153 30.7	10 14.0	+0.89018	+1.30314	+3.89	+0.5898		
	22	0.5557	0.918	0.010	320 27.1 21 21.8	152 36.1	10 10.4	0.89614	1.30263	4.01	0.6028		
	23	0.5585	0.928	0.011	320 22.9 21 21.5	151 41.4	10 6.8	0.90158	1.30212	4.13	0.6154		
	24	0.5612	0.938	0.009	320 13.8 21 20.9	150 46.6	10 3.1	0.90604	1.30159	4.24	0.6275		
	25	0.5640	0.948	+0.004	320 4.3 21 20.3	149 51.5	9 59.4	0.90928	1.30105	4.36	0.6392		
	26	0.5667	+0.958	-0.003	319 59.3 21 20.0	148 56.4	9 55.8	+0.91136	+1.30050	+4.47	+0.6504		
	27	0.5694	0.968	0.009	320 2.5 21 20.2	148 1.1	9 52.1	0.91258	1.29995	4.58	0.6612		
	28	0.5722	0.977	0.014	320 15.8 21 21.1	147 5.6	9 48.4	0.91352	1.29938	4.70	0.6717		
	29	0.5749	0.987	0.015	320 38.5 21 22.6	146 10.0	9 44.7	0.91483	1.29880	4.81	0.6818		
	30	0.5776	0.996	0.013	321 7.4 21 24.5	145 14.2	9 40.9	0.91707	1.29822	4.92	0.6916		
	31	0.5804	+1.006	-0.007	321 37.3 21 26.5	144 18.2	9 37.2	+0.92051	+1.29764	+5.02	+0.7010		
	Aug. (21.0)	1	0.5831	1.015	0.000	322 3.0 21 28.2	143 22.1	9 33.5	0.92509	1.29705	5.13	0.7101	
		2	0.5859	1.025	+0.007	322 20.5 21 29.4	142 25.8	9 29.7	0.93044	1.29644	5.24	0.7189	
		3	0.5886	1.034	0.013	322 28.4 21 29.9	141 29.3	9 26.0	0.93601	1.29583	5.34	0.7274	
		4	0.5913	1.043	0.017	322 27.6 21 29.8	140 32.6	9 22.2	0.94124	1.29521	5.44	0.7356	
		5	0.5941	+1.052	+0.017	322 20.5 21 29.4	139 35.8	9 18.4	+0.94574	+1.29460	+5.54	+0.7436	
		6	0.5968	1.061	0.014	322 10.5 21 28.7	138 38.8	9 14.6	0.94930	1.29398	5.64	0.7513	
		7	0.5996	1.070	0.009	322 1.1 21 28.1	137 41.6	9 10.8	0.95189	1.29335	5.74	0.7587	
8		0.6023	1.079	+0.003	321 55.0 21 27.7	136 44.2	9 6.9	0.95369	1.29273	5.83	0.7659		
9		0.6050	1.088	-0.003	321 53.8 21 27.6	135 46.6	9 3.1	0.95492	1.29210	5.93	0.7729		
10		0.6078	+1.097	-0.008	321 58.2 21 27.9	134 48.8	8 59.3	+0.95585	+1.29146	+6.02	+0.7797		
11		0.6105	1.105	0.012	322 8.2 21 28.5	133 51.0	8 55.4	0.95682	1.29084	6.11	0.7862		
12		0.6132	1.114	0.013	322 22.9 21 29.5	132 52.9	8 51.5	0.95810	1.29022	6.20	0.7925		
13		0.6160	1.122	0.012	322 40.7 21 30.7	131 54.6	8 47.6	0.95991	1.28959	6.29	0.7986		
14		0.6187	1.130	0.010	322 59.4 21 32.0	130 56.1	8 43.7	0.96240	1.28897	6.38	0.8045		
15		0.6215	+1.139	-0.006	323 16.6 21 33.1	129 57.4	8 39.8	+0.96566	+1.28834	+6.46	+0.8102		
16		0.6242	+1.147	0.000	323 29.9 21 34.0	128 58.6	8 35.9	+0.96961	+1.28773	+6.54	+0.8157		



(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f'$	$f''$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .		
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
Aug.	16	0.6242	+1.147	0.000	323 29.9	21 34.0	128 58.6	8 35.9	+0.96961	+1.28773	+6.54	+0.8157		
	17	0.6269	1.155	+0.005	323 37.0	21 34.5	127 59.6	8 32.0	0.97404	1.28712	6.62	0.8210		
	18	0.6297	1.163	0.009	323 36.9	21 34.5	127 0.3	8 28.0	0.97856	1.28651	6.70	0.8261		
	19	0.6324	1.171	0.011	323 30.2	21 34.0	126 0.9	8 24.1	0.98275	1.28590	6.78	0.8311		
	h (22.0)	20	0.6351	1.179	0.010	323 19.0	21 33.3	125 1.3	8 20.1	0.98623	1.28531	6.85	0.8359	
	21	0.6379	+1.187	+0.006	323 6.9	21 32.5	124 1.5	8 16.1	+0.98874	+1.28472	+6.93	+0.8405		
	22	0.6406	1.194	0.000	322 57.7	21 31.8	123 1.6	8 12.1	0.99027	1.28414	7.00	0.8449		
	23	0.6434	1.202	-0.007	322 54.8	21 31.6	122 1.4	8 8.1	0.99101	1.28357	7.07	0.8492		
	24	0.6461	1.210	0.012	323 0.3	21 32.0	121 1.1	8 4.1	0.99137	1.28301	7.13	0.8533		
	25	0.6488	1.217	0.014	323 14.3	21 33.0	120 0.6	8 0.0	0.99187	1.28245	7.20	0.8572		
	26	0.6516	+1.225	-0.013	323 34.5	21 34.3	118 59.9	7 56.0	+0.99301	+1.28191	+7.26	+0.8610		
	27	0.6543	1.232	0.009	323 56.8	21 35.8	117 59.0	7 51.9	0.99510	1.28138	7.32	0.8647		
	28	0.6571	1.239	-0.002	324 17.0	21 37.1	116 57.9	7 47.9	0.99818	1.28086	7.38	0.8682		
	29	0.6598	1.246	+0.005	324 31.2	21 38.1	115 56.6	7 43.8	1.00199	1.28036	7.44	0.8715		
	30	0.6625	1.254	0.012	324 37.4	21 38.5	114 55.2	7 39.7	1.00609	1.27987	7.49	0.8747		
	Sept.	31	0.6653	+1.261	+0.016	324 35.9	21 38.4	113 53.6	7 35.6	+1.01006	+1.27939	+7.55	+0.8778	
		1	0.6680	1.268	0.017	324 28.6	21 37.9	112 51.8	7 31.5	1.01348	1.27893	7.60	0.8807	
		2	0.6707	1.275	0.015	324 18.3	21 37.2	111 49.9	7 27.3	1.01611	1.27848	7.65	0.8835	
		3	0.6735	1.282	0.011	324 8.0	21 36.5	110 47.8	7 23.2	1.01792	1.27805	7.69	0.8861	
		h (23.0)	4	0.6762	1.289	+0.005	324 0.5	21 36.0	109 45.6	7 19.0	1.01901	1.27764	7.74	0.8886
		5	0.6790	+1.296	-0.001	323 57.3	21 35.8	108 43.2	7 14.9	+1.01955	+1.27725	+7.78	+0.8910	
		6	0.6817	1.302	0.007	323 59.2	21 35.9	107 40.7	7 10.7	1.01979	1.27687	7.82	0.8932	
		7	0.6844	1.309	0.011	324 6.3	21 36.4	106 38.1	7 6.6	1.02002	1.27651	7.86	0.8952	
		8	0.6872	1.316	0.013	324 17.9	21 37.2	105 35.3	7 2.4	1.02047	1.27617	7.89	0.8972	
		9	0.6899	1.322	0.013	324 32.6	21 38.2	104 32.4	6 58.2	1.02132	1.27585	7.92	0.8990	
		10	0.6926	+1.329	-0.011	324 48.7	21 39.2	103 29.4	6 54.0	+1.02274	+1.27555	+7.96	+0.9007	
	11	0.6954	1.336	0.007	325 4.1	21 40.3	102 26.2	6 49.7	1.02481	1.27528	7.99	0.9023		
	12	0.6981	1.342	-0.002	325 16.7	21 41.1	101 23.0	6 45.5	1.02749	1.27502	8.01	0.9037		
	13	0.7008	1.349	+0.003	325 24.6	21 41.6	100 19.7	6 41.3	1.03064	1.27478	8.04	0.9050		
	14	0.7036	1.355	0.007	325 26.6	21 41.8	99 16.2	6 37.1	1.03398	1.27457	8.06	0.9062		
	15	0.7064	+1.362	+0.010	325 22.8	21 41.5	98 12.7	6 32.9	+1.03717	+1.27438	+8.08	+0.9072		
16	0.7091	1.368	0.010	325 14.7	21 41.0	97 9.1	6 28.6	1.03984	1.27421	8.09	0.9081			
17	0.7118	1.375	0.007	325 5.0	21 40.3	96 5.4	6 24.4	1.04174	1.27406	8.11	0.9089			
18	0.7145	1.381	+0.001	324 57.1	21 39.8	95 1.7	6 20.1	1.04278	1.27394	8.12	0.9096			
19	0.7173	1.388	-0.005	324 54.4	21 39.6	93 57.8	6 15.9	1.04368	1.27384	8.13	0.9101			
h (0.0)	20	0.7200	+1.394	-0.010	324 59.1	21 39.9	92 54.0	+1.04295	+1.27376	+8.14	+0.9105			
21	0.7228	1.400	0.013	325 11.6	21 40.8	91 50.0	6 7.3	1.04285	1.27371	8.14	0.9108			
22	0.7255	1.407	0.013	325 30.6	21 42.0	90 46.0	6 3.1	1.04322	1.27368	8.15	0.9110			
23	0.7282	1.413	0.010	325 52.8	21 43.5	89 42.0	5 58.8	1.04439	1.27367	8.15	0.9110			
24	0.7310	1.420	-0.004	326 14.2	21 44.9	88 37.9	5 54.5	1.04645	1.27369	8.15	0.9109			
25	0.7337	+1.426	+0.004	326 31.0	21 46.1	87 33.8	5 50.3	+1.04926	+1.27374	+8.14	+0.9107			
26	0.7364	1.432	0.011	326 41.0	21 46.7	86 29.6	5 46.0	1.05244	1.27380	8.13	0.9103			
27	0.7392	1.439	0.016	326 43.9	21 46.9	85 25.5	5 41.7	1.05559	1.27389	8.12	0.9098			
28	0.7419	1.445	0.018	326 40.8	21 46.7	84 21.3	5 37.4	1.05834	1.27401	8.11	0.9092			
29	0.7447	1.452	0.017	326 34.4	21 46.3	83 17.1	5 33.1	1.06044	1.27415	8.10	0.9085			
30	0.7474	+1.458	+0.013	326 27.6	21 45.8	82 12.9	5 28.9	+1.06180	+1.27431	+8.08	+0.9076			
Oct.	1	0.7501	+1.464	+0.007	326 22.9	21 45.5	81 8.8	+1.06246	+1.27449	+8.06	+0.9066			

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)	$\tau$	$f'$	$f''$	$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	$y$	$s$	$s$	$^{\circ}$	$h$ $m$	$^{\circ}$	$h$ $m$			$''$	
Oct. 1	0.7501	+1.464	+0.007	326 22.9	21 45.5	81 8.8	5 24.6	+1.06246	+1.27449	+8.06	+0.9066
2	0.7529	1.471	+0.001	326 22.0	21 45.5	80 4.6	5 20.3	1.06260	1.27470	8.04	0.9055
3	0.7556	1.478	-0.005	326 26.0	21 45.7	79 0.5	5 16.0	1.06247	1.27493	8.02	0.9042
4	0.7584	1.484	0.010	326 35.0	21 46.3	77 56.5	5 11.8	1.06228	1.27518	7.99	0.9028
h (1.0) 5	0.7611	1.491	0.013	326 48.4	21 47.2	76 52.4	5 7.5	1.06227	1.27546	7.97	0.9013
6	0.7638	+1.497	-0.013	327 5.0	21 48.3	75 48.4	5 3.2	+1.06265	+1.27575	+7.94	+0.8996
7	0.7666	1.504	0.012	327 23.2	21 49.5	74 44.5	4 59.0	1.06354	1.27607	7.90	0.8978
8	0.7693	1.511	0.009	327 41.2	21 50.7	73 40.6	4 54.7	1.06500	1.27641	7.87	0.8958
9	0.7720	1.518	-0.004	327 57.0	21 51.8	72 36.8	4 50.5	1.06703	1.27677	7.83	0.8938
10	0.7748	1.525	+0.001	328 9.0	21 52.6	71 33.1	4 46.2	1.06954	1.27715	7.79	0.8915
11	0.7775	+1.531	+0.006	328 15.8	21 53.1	70 29.5	4 42.0	+1.07229	+1.27754	+7.75	+0.8892
12	0.7802	1.538	0.009	328 17.2	21 53.1	69 26.0	4 37.7	1.07499	1.27796	7.70	0.8867
13	0.7830	1.545	0.009	328 14.2	21 52.9	68 22.5	4 33.5	1.07732	1.27840	7.66	0.8840
14	0.7857	1.553	0.007	328 9.2	21 52.6	67 19.1	4 29.3	1.07902	1.27885	7.61	0.8812
15	0.7885	1.560	+0.002	328 5.2	21 52.3	66 15.9	4 25.1	1.07998	1.27932	7.56	0.8782
16	0.7912	+1.567	-0.004	328 5.4	21 52.4	65 12.8	4 20.9	+1.08028	+1.27980	+7.50	+0.8751
17	0.7939	1.574	0.010	328 12.1	21 52.8	64 9.7	4 16.6	1.08017	1.28031	7.45	0.8719
18	0.7967	1.581	0.014	328 26.4	21 53.8	63 6.8	4 12.5	1.08001	1.28083	7.39	0.8684
19	0.7994	1.589	0.014	328 47.2	21 55.1	62 4.0	4 8.3	1.08023	1.28136	7.33	0.8649
h (2.0) 20	0.8022	1.596	0.012	329 11.7	21 56.8	61 1.3	4 4.1	1.08116	1.28190	7.26	0.8611
21	0.8049	+1.604	-0.006	329 36.3	21 58.4	59 58.7	3 59.9	+1.08294	+1.28246	+7.20	+0.8572
22	0.8076	1.611	+0.002	329 57.3	21 59.8	58 56.3	3 55.8	1.08547	1.28303	7.13	0.8531
23	0.8104	1.619	0.009	330 12.4	22 0.8	57 54.0	3 51.6	1.08847	1.28361	7.06	0.8488
24	0.8131	1.627	0.015	330 20.6	22 1.4	56 51.8	3 47.5	1.09154	1.28420	6.99	0.8444
25	0.8158	1.635	0.018	330 22.7	22 1.5	55 49.7	3 43.3	1.09429	1.28480	6.92	0.8398
26	0.8186	+1.643	+0.018	330 21.1	22 1.4	54 47.8	3 39.2	+1.09646	+1.28541	+6.84	+0.8350
27	0.8213	1.651	0.015	330 18.4	22 1.2	53 45.9	3 35.1	1.09795	1.28603	6.76	0.8300
28	0.8241	1.659	0.010	330 17.1	22 1.1	52 44.3	3 31.0	1.09878	1.28666	6.68	0.8248
29	0.8268	1.667	+0.003	330 19.3	22 1.3	51 42.8	3 26.9	1.09911	1.28729	6.60	0.8194
30	0.8295	1.676	-0.003	330 26.1	22 1.7	50 41.5	3 22.8	1.09916	1.28793	6.51	0.8138
31	0.8323	+1.684	-0.008	330 37.6	22 2.5	49 40.3	3 18.7	+1.09918	+1.28858	+6.43	+0.8080
Nov. 1	0.8350	1.693	0.012	330 53.2	22 3.5	48 39.2	3 14.6	1.09938	1.28923	6.34	0.8020
2	0.8378	1.701	0.013	331 11.9	22 4.8	47 38.3	3 10.6	1.09995	1.28988	6.25	0.7958
3	0.8405	1.710	0.012	331 32.2	22 6.1	46 37.5	3 6.5	1.10099	1.29054	6.16	0.7893
h (3.0) 4	0.8432	1.719	0.009	331 52.3	22 7.5	45 36.9	3 2.5	1.10257	1.29119	6.06	0.7826
5	0.8460	+1.728	-0.005	332 10.5	22 8.7	44 36.5	2 58.4	+1.10469	+1.29184	+5.96	+0.7756
6	0.8487	1.737	0.000	332 25.1	22 9.7	43 36.2	2 54.4	1.10724	1.29250	5.87	0.7684
7	0.8514	1.746	+0.005	332 35.0	22 10.3	42 36.0	2 50.4	1.11004	1.29315	5.77	0.7610
8	0.8542	1.755	0.008	332 39.7	22 10.6	41 36.0	2 46.4	1.11285	1.29381	5.67	0.7532
9	0.8569	1.764	0.009	332 40.1	22 10.7	40 36.2	2 42.4	1.11537	1.29446	5.56	0.7452
10	0.8596	+1.774	+0.007	332 38.1	22 10.5	39 36.6	2 38.4	+1.11738	+1.29511	+5.46	+0.7369
11	0.8624	1.783	+0.003	332 36.4	22 10.4	38 37.1	2 34.5	1.11876	1.29576	5.35	0.7283
12	0.8651	1.793	-0.003	332 37.8	22 10.5	37 37.7	2 30.5	1.11952	1.29640	5.24	0.7194
13	0.8679	1.803	0.009	332 44.8	22 11.0	36 38.5	2 26.6	1.11988	1.29703	5.13	0.7102
14	0.8706	1.812	0.014	332 58.5	22 11.9	35 39.4	2 22.6	1.12020	1.29766	5.02	0.7006
15	0.8733	+1.822	-0.016	333 18.4	22 13.2	34 40.4	2 18.7	+1.12083	+1.29828	+4.91	+0.6906
16	0.8761	+1.832	-0.014	333 42.2	22 14.8	33 41.7	2 14.8	+1.12210	+1.29889	+4.79	+0.6803

(CONSTANTS OF PARIS CONFERENCE.)

## FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hour.)		$\tau$	$f'$		$f''$		$G$		$H$		Log $g$ .	Log $h$ .	$i$	Log $i$ .			
			In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.							
		$s$	$s$	$^{\circ}$	$h$	$m$ .	$^{\circ}$	$h$	$m$								
Nov.	16	0.8761	+1.832	-0.014	333	42.2	22	14.8	33	41.7	2	14.8	+1.12210	+1.29889	+4.79	+0.6803	
	17	0.8788	1.842	0.009	334	6.8	22	16.5	32	43.1	2	10.9	1.12416	1.29950	4.67	0.6696	
	18	0.8816	1.852	-0.002	334	28.6	22	17.9	31	44.6	2	7.0	1.12698	1.30009	4.55	0.6585	
	19	0.8843	1.863	+0.006	334	44.9	22	19.0	30	46.2	2	3.1	1.13029	1.30068	4.43	0.6469	
	h (4.0)	20	0.8870	1.873	0.013	334	54.8	22	19.6	29	48.0	1	59.2	1.13371	1.30125	4.31	0.6349
	21	0.8898	+1.883	+0.018	334	58.6	22	19.9	28	49.9	1	55.3	+1.13689	+1.30182	+4.19	+0.6224	
	22	0.8925	1.894	0.019	334	58.4	22	19.9	27	51.9	1	51.5	1.13957	1.30237	4.07	0.6094	
	23	0.8952	1.905	0.017	334	56.6	22	19.8	26	54.0	1	47.6	1.14161	1.30291	3.94	0.5958	
	24	0.8980	1.915	0.012	334	55.6	22	19.7	25	56.2	1	43.7	1.14302	1.30344	3.82	0.5816	
	25	0.9007	1.926	+0.006	334	57.5	22	19.8	24	58.6	1	39.9	1.14393	1.30395	3.69	0.5668	
	26	0.9035	+1.937	0.000	335	3.3	22	20.2	24	1.1	1	36.1	+1.14457	+1.30445	+3.56	+0.5514	
	27	0.9062	1.948	-0.006	335	13.3	22	20.9	23	3.6	1	32.2	1.14517	1.30494	3.43	0.5352	
	28	0.9089	1.959	0.010	335	27.0	22	21.8	22	6.3	1	28.4	1.14593	1.30541	3.30	0.5183	
	29	0.9117	1.970	0.012	335	43.4	22	22.9	21	9.1	1	24.6	1.14700	1.30586	3.17	0.5005	
	30	0.9144	1.981	0.012	336	1.2	22	24.1	20	12.0	1	20.8	1.14849	1.30630	3.03	0.4818	
Dec.	1	0.9172	+1.992	-0.010	336	18.8	22	25.3	19	14.9	1	17.0	+1.15046	+1.30672	+2.90	+0.4621	
	2	0.9199	2.003	0.006	336	34.6	22	26.3	18	18.0	1	13.2	1.15290	1.30712	2.76	0.4414	
	3	0.9226	2.015	-0.001	336	47.2	22	27.1	17	21.1	1	9.4	1.15572	1.30751	2.63	0.4194	
	4	0.9254	2.026	+0.004	336	55.6	22	27.7	16	24.4	1	5.6	1.15877	1.30788	2.49	0.3961	
	h (5.0)	5	0.9281	2.038	0.008	336	59.3	22	28.0	15	27.7	1	1.8	1.16183	1.30823	2.35	0.3714
	6	0.9308	+2.049	+0.010	336	58.7	22	27.9	14	31.1	0	58.1	+1.16467	+1.30856	+2.21	+0.3450	
	7	0.9336	2.061	0.009	336	55.4	22	27.7	13	34.5	0	54.3	1.16707	1.30888	2.07	0.3167	
	8	0.9363	2.072	+0.005	336	51.8	22	27.5	12	38.0	0	50.5	1.16891	1.30917	1.93	0.2864	
	9	0.9391	2.084	-0.001	336	50.3	22	27.4	11	41.7	0	46.8	1.17020	1.30944	1.79	0.2536	
	10	0.9418	2.096	0.008	336	53.2	22	27.5	10	45.3	0	43.0	1.17110	1.30970	1.65	0.2179	
	11	0.9445	+2.107	-0.013	337	1.8	22	28.1	9	49.0	0	39.3	+1.17187	+1.30993	+1.51	+0.1789	
	12	0.9473	2.119	0.016	337	16.0	22	29.1	8	52.8	0	35.5	1.17287	1.31014	1.37	0.1360	
	13	0.9500	2.131	0.016	337	34.0	22	30.3	7	56.6	0	31.8	1.17439	1.31034	1.22	0.0881	
	14	0.9527	2.143	0.013	337	53.2	22	31.5	7	0.4	0	28.0	1.17660	1.31051	1.08	0.0341	
	15	0.9555	2.155	-0.006	338	10.5	22	32.7	6	4.3	0	24.3	1.17950	1.31066	0.94	9.9723	
	16	0.9582	+2.167	+0.002	338	23.3	22	33.6	5	8.2	0	20.5	+1.18290	+1.31079	+0.80	+9.9000	
	17	0.9610	2.179	0.010	338	30.4	22	34.0	4	12.1	0	16.8	1.18647	1.31090	0.65	9.8131	
	18	0.9637	2.191	0.016	338	31.9	22	34.1	3	16.0	0	13.1	1.18987	1.31098	0.51	9.7041	
	19	0.9664	2.203	0.019	338	29.2	22	33.9	2	20.0	0	9.3	1.19286	1.31105	0.36	9.5580	
	h (6.0)	20	0.9692	2.214	0.018	338	24.5	22	33.6	1	23.9	0	5.6	1.19528	1.31109	0.22	9.3360
	21	0.9719	+2.226	+0.014	338	20.1	22	33.3	0	27.9	0	1.9	+1.19710	+1.31111	+0.07	+8.8572	
	22	0.9746	2.238	0.008	338	17.8	22	33.2	359	31.8	23	58.1	1.19843	1.31111	-0.07	-8.8624	
	23	0.9774	2.250	+0.002	338	18.9	22	33.3	358	35.7	23	54.4	1.19945	1.31109	0.22	9.3378	
	24	0.9801	2.262	-0.004	338	23.7	22	33.6	357	39.6	23	50.6	1.20036	1.31105	0.36	9.5593	
	25	0.9829	2.274	0.009	338	31.8	22	34.1	356	43.5	23	46.9	1.20136	1.31098	0.51	9.7052	
	26	0.9856	+2.286	-0.012	338	42.4	22	34.8	355	47.4	23	43.2	+1.20262	+1.31090	-0.65	-9.8141	
	27	0.9883	2.298	0.012	338	54.3	22	35.6	354	51.2	23	39.4	1.20422	1.31079	0.80	9.9010	
	28	0.9911	2.310	0.010	339	6.2	22	36.4	353	55.0	23	35.7	1.20622	1.31066	0.94	9.9732	
	29	0.9938	2.322	0.006	339	16.7	22	37.1	352	58.7	23	31.9	1.20861	1.31051	1.08	0.0351	
	30	0.9966	2.334	-0.002	339	24.5	22	37.6	352	2.4	23	28.2	1.21132	1.31034	1.23	0.0890	
	31	0.9993	+2.346	+0.003	339	28.8	22	37.9	351	6.0	23	24.4	+1.21424	+1.31014	-1.37	-0.1369	
	32	1.0020	+2.358	+0.008	339	29.1	22	37.9	350	9.6	23	20.6	+1.21721	+1.30993	-1.51	-0.1800	

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

α Ursæ Min. (Polaris).			51 Cephei (Hrv.).			6 Ursæ Min. (B.).			δ Ursæ Min.			λ Ursæ Min.		
Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.	Mean Solar Date.	Right Ascension.	Declina- tion North.
Jan.	h m 1 26	° +88 49	Jan.	h m 6 58	° +87 11	Jan.	h m 12 14	° +88 11	Jan.	h m 18 1	° +86 36	Jan.	h m 19 9	° +89 0
	s	"		s	"		s	"		s	"		s	"
0.3	52.28	49.2	0.5	59.21	34.3	0.7	37.32	41.2	0.9	0.81	43.9	1.0	57.43	19.6
1.3	51.16	49.3	1.5	59.30	34.6	1.7	38.09	41.1	1.9	0.86	43.6	2.0	57.17	19.2
2.3	50.08	49.4	2.5	59.37	35.0	2.7	38.81	41.1	2.9	0.92	43.2	3.0	56.95	18.9
3.3	49.05	49.5	3.5	59.43	35.3	3.7	39.50	41.1	3.9	0.97	42.9	4.0	56.75	18.6
4.3	48.06	49.5	4.5	59.49	35.6	4.7	40.16	41.1	4.9	1.02	42.6	5.0	56.55	18.3
5.3	47.11	49.6	5.5	59.57	35.9	5.7	40.80	41.1	5.9	1.06	42.3	6.0	56.32	18.0
6.3	46.19	49.7	6.5	59.66	36.1	6.7	41.45	41.1	6.9	1.09	42.0	7.0	56.04	17.7
7.3	45.26	49.8	7.5	59.77	36.4	7.7	42.12	41.1	7.9	1.11	41.6	8.0	55.72	17.4
8.3	44.30	49.9	8.5	59.88	36.7	8.7	42.82	41.1	8.9	1.13	41.3	8.9	55.38	17.1
9.3	43.28	50.0	9.5	59.99	37.0	9.7	43.55	41.0	9.9	1.15	41.0	9.9	55.04	16.7
10.3	42.21	50.1	10.5	60.10	37.4	10.7	44.32	41.0	10.9	1.19	40.6	10.9	54.74	16.4
11.3	41.08	50.2	11.5	60.20	37.7	11.7	45.12	41.0	11.9	1.25	40.2	11.9	54.49	16.0
12.2	39.91	50.3	12.5	60.26	38.1	12.7	45.92	41.1	12.9	1.33	39.8	12.9	54.32	15.7
13.2	38.71	50.4	13.5	60.29	38.5	13.7	46.71	41.2	13.9	1.44	39.5	13.9	54.23	15.3
14.2	37.52	50.4	14.5	60.30	38.8	14.7	47.48	41.3	14.9	1.57	39.1	14.9	54.22	14.9
15.2	36.37	50.4	15.5	60.29	39.2	15.7	48.21	41.4	15.9	1.70	38.8	15.9	54.28	14.6
16.2	35.27	50.4	16.5	60.25	39.5	16.7	48.90	41.5	16.9	1.84	38.5	16.9	54.37	14.2
17.2	34.23	50.4	17.5	60.20	39.8	17.7	49.55	41.6	17.9	1.98	38.2	17.9	54.47	13.9
18.2	33.25	50.5	18.5	60.17	40.1	18.7	50.17	41.7	18.9	2.11	37.9	18.9	54.56	13.6
19.2	32.29	50.5	19.5	60.14	40.4	19.7	50.78	41.7	19.9	2.23	37.6	19.9	54.62	13.3
20.2	31.34	50.5	20.4	60.12	40.7	20.7	51.39	41.8	20.9	2.34	37.3	20.9	54.64	13.0
21.2	30.39	50.5	21.4	60.11	41.0	21.7	52.02	41.9	21.9	2.44	37.0	21.9	54.63	12.7
22.2	29.41	50.5	22.4	60.11	41.3	22.7	52.68	42.0	22.9	2.55	36.7	22.9	54.60	12.4
23.2	28.37	50.5	23.4	60.11	41.6	23.7	53.37	42.0	23.9	2.68	36.4	23.9	54.60	12.0
24.2	27.27	50.6	24.4	60.09	41.9	24.7	54.09	42.1	24.9	2.82	36.0	24.9	54.66	11.7
25.2	26.12	50.6	25.4	60.05	42.3	25.7	54.83	42.2	25.9	2.99	35.7	25.9	54.79	11.3
26.2	24.94	50.6	26.4	59.98	42.6	26.7	55.56	42.4	26.9	3.18	35.4	26.9	55.00	11.0
27.2	23.75	50.5	27.4	59.88	43.0	27.7	56.28	42.5	27.9	3.39	35.0	27.9	55.30	10.6
28.2	22.57	50.5	28.4	59.74	43.3	28.7	56.97	42.7	28.9	3.62	34.7	28.9	55.69	10.2
29.2	21.44	50.4	29.4	59.57	43.7	29.7	57.62	42.8	29.9	3.86	34.4	29.9	56.14	9.9
30.2	20.36	50.3	30.4	59.40	44.0	30.7	58.22	43.0	30.9	4.11	34.2	30.9	56.62	9.6
31.2	19.34	50.2	31.4	59.23	44.3	31.6	58.78	43.2	31.9	4.35	33.9	31.9	57.10	9.3
32.2	18.37	50.1	32.4	59.05	44.5	32.6	59.31	43.4	32.9	4.57	33.7	32.9	57.56	9.0

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (Polaris).		Mean Solar Date.	γ Cephei (Hév.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Feb.	h m 1 25	° +88 49	Feb.	h m 6 58	° +87 11	Feb.	h m 12 14	° +88 11	Feb.	h m 18 1	° +86 36	Feb.	h m 19 9	° +89 0
	s	"		s	"		s	"		s	"		s	"
1.2	78.37	50.1	1.4	59.05	44.5	1.6	59.31	43.4	1.9	4.57	33.7	1.9	57.56	9.0
2.2	77.44	50.0	2.4	58.88	44.8	2.6	59.83	43.5	2.9	4.79	33.4	2.9	57.98	8.7
3.2	76.54	49.9	3.4	58.73	45.1	3.6	60.35	43.7	3.9	4.99	33.2	3.9	58.36	8.5
4.2	75.62	49.8	4.4	58.60	45.3	4.6	60.89	43.8	4.9	5.19	33.0	4.9	58.70	8.2
5.2	74.66	49.8	5.4	58.48	45.6	5.6	61.46	43.9	5.9	5.39	32.7	5.9	59.02	7.9
6.2	73.66	49.7	6.4	58.35	45.9	6.6	62.06	44.1	6.9	5.60	32.4	6.9	59.37	7.6
7.2	72.61	49.6	7.4	58.21	46.2	7.6	62.68	44.3	7.9	5.83	32.1	7.9	59.77	7.3
8.2	71.53	49.5	8.4	58.05	46.5	8.6	63.31	44.5	8.9	6.08	31.8	8.9	60.24	6.9
9.2	70.43	49.4	9.4	57.86	46.9	9.6	63.94	44.7	9.9	6.35	31.6	9.9	60.78	6.6
10.2	69.33	49.3	10.4	57.63	47.2	10.6	64.54	44.9	10.9	6.64	31.3	10.9	61.40	6.3
11.2	68.26	49.2	11.4	57.39	47.5	11.6	65.10	45.2	11.9	6.94	31.0	11.9	62.09	6.0
12.2	67.25	49.0	12.4	57.13	47.8	12.6	65.61	45.4	12.9	7.25	30.8	12.9	62.82	5.7
13.2	66.31	48.9	13.4	56.86	48.0	13.6	66.08	45.7	13.8	7.55	30.6	13.9	63.57	5.4
14.2	65.42	48.7	14.4	56.58	48.3	14.6	66.51	45.9	14.8	7.84	30.4	14.9	64.32	5.2
15.2	64.59	48.5	15.4	56.32	48.5	15.6	66.92	46.2	15.8	8.13	30.3	15.9	65.04	4.9
16.2	63.80	48.3	16.4	56.07	48.7	16.6	67.31	46.4	16.8	8.40	30.1	16.9	65.70	4.7
17.2	63.02	48.2	17.4	55.84	48.9	17.6	67.71	46.6	17.8	8.66	29.9	17.9	66.32	4.5
18.2	62.23	48.0	18.4	55.62	49.1	18.6	68.13	46.8	18.8	8.91	29.7	18.9	66.92	4.2
19.1	61.41	47.9	19.4	55.40	49.4	19.6	68.57	47.1	19.8	9.17	29.5	19.9	67.53	4.0
20.1	60.54	47.8	20.4	55.18	49.6	20.6	69.05	47.3	20.8	9.45	29.3	20.9	68.17	3.7
21.1	59.63	47.6	21.4	54.93	49.9	21.6	69.54	47.5	21.8	9.74	29.1	21.9	68.87	3.4
22.1	58.68	47.4	22.4	54.65	50.2	22.6	70.03	47.7	22.8	10.06	28.9	22.9	69.64	3.1
23.1	57.72	47.2	23.4	54.35	50.4	23.6	70.50	48.0	23.8	10.40	28.7	23.9	70.50	2.9
24.1	56.78	47.0	24.4	54.01	50.7	24.6	70.94	48.3	24.8	10.76	28.5	24.9	71.45	2.6
25.1	55.88	46.8	25.4	53.65	50.9	25.6	71.34	48.6	25.8	11.13	28.3	25.9	72.46	2.3
26.1	55.04	46.5	26.4	53.28	51.1	26.6	71.69	48.9	26.8	11.50	28.2	26.9	73.49	2.1
27.1	54.28	46.3	27.4	52.91	51.3	27.6	71.99	49.2	27.8	11.87	28.1	27.9	74.53	1.9
28.1	53.59	46.0	28.4	52.54	51.5	28.6	72.25	49.5	28.8	12.22	28.0	28.9	75.56	1.7
29.1	52.95	45.8	29.3	52.18	51.7	29.6	72.49	49.8	29.8	12.55	27.9	29.9	76.54	1.5
30.1	52.33	45.5	30.3	51.84	51.8	30.6	72.72	50.0	30.8	12.88	27.8	30.9	77.47	1.4

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (Polaris).			Mean Solar Date.	51 Cephei (Heg.).			Mean Solar Date.	6 Ursæ Min. (B.).			Mean Solar Date.	δ Ursæ Min.			Mean Solar Date.	λ Ursæ Min.		
	Right Ascension.	Declina- tion North.			Right Ascension.	Declina- tion North.			Right Ascension.	Declina- tion North.			Right Ascension.	Declina- tion North.			Right Ascension.	Declina- tion North.	
Mar.	h m 1 25	° +88 49		Mar.	h m 6 58	° +87 11		Mar.	h m 12 15	° +88 11		Mar.	h m 18 1	° +86 36		Mar.	h m 19 10	° +88 59	
	s "				s "				s "				s "				s "		
1.1	52.95	45.8		1.3	52.18	51.7		1.6	12.49	49.8		1.8	12.55	27.9		1.9	16.54	61.5	
2.1	52.33	45.5		2.3	51.84	51.8		2.6	12.72	50.0		2.8	12.88	27.8		2.9	17.47	61.4	
3.1	51.73	45.3		3.3	51.51	52.0		3.6	12.96	50.3		3.8	13.20	27.7		3.8	18.34	61.2	
4.1	51.11	45.1		4.3	51.20	52.2		4.6	13.22	50.5		4.8	13.50	27.6		4.8	19.19	61.0	
5.1	50.47	44.9		5.3	50.90	52.3		5.6	13.51	50.8		5.8	13.80	27.5		5.8	20.05	60.8	
6.1	49.79	44.7		6.3	50.58	52.5		6.6	13.82	51.1		6.8	14.12	27.3		6.8	20.93	60.6	
7.1	49.06	44.5		7.3	50.25	52.7		7.6	14.15	51.4		7.8	14.46	27.2		7.8	21.84	60.4	
8.1	48.32	44.2		8.3	49.91	52.9		8.6	14.47	51.7		8.8	14.82	27.1		8.8	22.82	60.2	
9.1	47.59	44.0		9.3	49.54	53.1		9.5	14.76	52.0		9.8	15.19	27.0		9.8	23.88	60.0	
10.1	46.88	43.7		10.3	49.14	53.3		10.5	15.02	52.3		10.8	15.57	26.9		10.8	25.01	59.8	
11.1	46.23	43.4		11.3	48.73	53.5		11.5	15.23	52.7		11.8	15.96	26.8		11.8	26.18	59.6	
12.1	45.65	43.1		12.3	48.31	53.6		12.5	15.39	53.0		12.8	16.34	26.8		12.8	27.36	59.5	
13.1	45.15	42.8		13.3	47.89	53.7		13.5	15.50	53.3		13.8	16.72	26.7		13.8	28.53	59.4	
14.1	44.71	42.5		14.3	47.48	53.8		14.5	15.57	53.7		14.8	17.08	26.7		14.8	29.67	59.3	
15.1	44.33	42.2		15.3	47.08	53.9		15.5	15.63	54.0		15.8	17.42	26.7		15.8	30.76	59.2	
16.1	43.98	42.0		16.3	46.71	54.0		16.5	15.69	54.3		16.8	17.74	26.7		16.8	31.79	59.1	
17.1	43.63	41.7		17.3	46.35	54.1		17.5	15.76	54.6		17.8	18.06	26.7		17.8	32.78	59.0	
18.1	43.26	41.5		18.3	46.00	54.1		18.5	15.84	54.8		18.8	18.37	26.7		18.8	33.75	58.9	
19.1	42.85	41.2		19.3	45.65	54.2		19.5	15.96	55.1		19.8	18.69	26.6		19.8	34.74	58.8	
20.1	42.40	41.0		20.3	45.30	54.4		20.5	16.11	55.4		20.8	19.03	26.6		20.8	35.76	58.6	
21.1	41.92	40.7		21.3	44.93	54.5		21.5	16.25	55.7		21.7	19.38	26.5		21.8	36.84	58.5	
22.1	41.43	40.4		22.3	44.53	54.6		22.5	16.38	56.0		22.7	19.76	26.5		22.8	37.99	58.4	
23.1	40.95	40.1		23.3	44.10	54.7		23.5	16.49	56.3		23.7	20.15	26.5		23.8	39.21	58.2	
24.1	40.51	39.8		24.3	43.65	54.8		24.5	16.55	56.7		24.7	20.55	26.5		24.8	40.49	58.1	
25.0	40.13	39.5		25.3	43.19	54.9		25.5	16.56	57.0		25.7	20.95	26.5		25.8	41.81	58.1	
26.0	39.81	39.2		26.3	42.72	54.9		26.5	16.53	57.4		26.7	21.35	26.6		26.8	43.14	58.0	
27.0	39.58	38.8		27.3	42.26	55.0		27.5	16.46	57.7		27.7	21.74	26.6		27.8	44.44	58.0	
28.0	39.41	38.5		28.3	41.82	55.0		28.5	16.35	58.0		28.7	22.11	26.7		28.8	45.68	58.0	
29.0	39.29	38.2		29.3	41.40	55.0		29.5	16.22	58.3		29.7	22.45	26.8		29.8	46.87	57.9	
30.0	39.19	37.9		30.3	41.00	55.0		30.5	16.09	58.6		30.7	22.77	26.9		30.8	48.00	57.9	
31.0	39.09	37.6		31.3	40.61	55.0		31.5	15.99	58.8		31.7	23.09	26.9		31.8	49.08	57.9	
32.0	38.96	37.3		32.3	40.23	55.0		32.5	15.91	59.1		32.7	23.40	27.0		32.8	50.13	57.9	

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hgv.)		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Apr.	h m 1 25	° ' +88 49	Apr.	h m 6 58	° ' +87 11	Apr.	h m 12 15	° ' +88 11	Apr.	h m 18 1	° ' +86 36	Apr.	h m 19 10	° ' +88 59
	s	"		s	"		s	"		s	"		s	"
1.0	38.96	37.3	1.3	40.23	55.0	1.5	15.91	59.1	1.7	23.40	27.0	1.8	50.13	57.9
2.0	38.81	37.1	2.3	39.86	55.0	2.5	15.85	59.4	2.7	23.72	27.0	2.8	51.19	57.9
3.0	38.62	36.8	3.3	39.49	55.0	3.5	15.81	59.7	3.7	24.05	27.1	3.8	52.27	57.8
4.0	38.40	36.5	4.3	39.11	55.1	4.5	15.77	60.0	4.7	24.39	27.1	4.8	53.40	57.8
5.0	38.18	36.2	5.3	38.70	55.1	5.5	15.72	60.3	5.7	24.75	27.2	5.8	54.59	57.7
6.0	38.00	35.9	6.3	38.27	55.1	6.5	15.64	60.6	6.7	25.11	27.2	6.8	55.83	57.7
7.0	37.86	35.6	7.2	37.83	55.1	7.5	15.51	60.9	7.7	25.48	27.3	7.8	57.11	57.7
8.0	37.78	35.2	8.2	37.38	55.1	8.5	15.33	61.3	8.7	25.84	27.4	8.8	58.40	57.7
9.0	37.77	34.9	9.2	36.93	55.1	9.5	15.10	61.6	9.7	26.19	27.6	9.7	59.67	57.7
10.0	37.84	34.6	10.2	36.49	55.0	10.5	14.83	61.9	10.7	26.53	27.7	10.7	60.92	57.8
11.0	37.97	34.2	11.2	36.07	54.9	11.5	14.54	62.2	11.7	26.85	27.9	11.7	62.12	57.8
12.0	38.15	33.9	12.2	35.68	54.8	12.5	14.24	62.5	12.7	27.14	28.1	12.7	63.24	57.9
13.0	38.35	33.7	13.2	35.31	54.8	13.5	13.95	62.8	13.7	27.42	28.2	13.7	64.29	58.0
13.9	38.54	33.4	14.2	34.96	54.7	14.5	13.68	63.0	14.7	27.69	28.4	14.7	65.30	58.0
14.9	38.69	33.1	15.2	34.62	54.6	15.4	13.45	63.3	15.7	27.96	28.5	15.7	66.30	58.1
15.9	38.80	32.8	16.2	34.27	54.6	16.4	13.23	63.5	16.7	28.24	28.6	16.7	67.31	58.1
16.9	38.87	32.6	17.2	33.91	54.5	17.4	13.02	63.8	17.7	28.53	28.7	17.7	68.36	58.2
17.9	38.92	32.3	18.2	33.53	54.5	18.4	12.81	64.0	18.7	28.84	28.9	18.7	69.47	58.2
18.9	38.97	32.0	19.2	33.13	54.4	19.4	12.59	64.3	19.7	29.17	29.0	19.7	70.65	58.3
19.9	39.05	31.7	20.2	32.71	54.4	20.4	12.34	64.6	20.7	29.50	29.1	20.7	71.87	58.3
20.9	39.18	31.4	21.2	32.28	54.3	21.4	12.04	64.9	21.7	29.83	29.3	21.7	73.13	58.4
21.9	39.38	31.0	22.2	31.84	54.2	22.4	11.68	65.2	22.7	30.15	29.5	22.7	74.39	58.5
22.9	39.66	30.7	23.2	31.41	54.1	23.4	11.28	65.5	23.7	30.47	29.7	23.7	75.64	58.6
23.9	40.01	30.4	24.2	31.01	53.9	24.4	10.85	65.8	24.7	30.77	29.9	24.7	76.83	58.7
24.9	40.42	30.1	25.2	30.63	53.8	25.4	10.41	66.0	25.7	31.05	30.2	25.7	77.95	58.9
25.9	40.86	29.8	26.2	30.27	53.6	26.4	9.96	66.2	26.7	31.30	30.4	26.7	79.00	59.0
26.9	41.30	29.5	27.2	29.93	53.4	27.4	9.53	66.4	27.7	31.52	30.6	27.7	79.97	59.2
27.9	41.72	29.2	28.2	29.61	53.3	28.4	9.12	66.6	28.7	31.74	30.8	28.7	80.89	59.3
28.9	42.11	29.0	29.2	29.31	53.2	29.4	8.75	66.8	29.6	31.96	31.0	29.7	81.79	59.5
29.9	42.46	28.8	30.2	29.01	53.0	30.4	8.40	67.0	30.6	32.19	31.2	30.7	82.71	59.6
30.9	42.79	28.5	31.2	28.69	52.9	31.4	8.06	67.2	31.6	32.42	31.4	31.7	83.65	59.7
31.9	43.10	28.3	32.2	28.37	52.8	32.4	7.71	67.4	32.6	32.67	31.6	32.7	84.63	59.8

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>a</i> Ursæ Min. ( <i>Polaris</i> ).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	<i>δ</i> Ursæ Min.		Mean Solar Date.	<i>λ</i> Ursæ Min.	
	Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .
May	h m 1 25	° +88 49	May	h m 6 58	° +87 11	May	h m 12 14	° +88 12	May	h m 18 1	° +86 36	May	h m 19 11	° +88 59
	s	"		s	"		s	"		s	"		s	"
1.9	43.10	28.3	1.2	28.69	52.9	1.4	68.06	7.2	1.6	32.42	31.4	1.7	23.65	59.7
2.9	43.42	28.0	2.2	28.37	52.8	2.4	67.71	7.4	2.6	32.67	31.6	2.7	24.63	59.8
3.9	43.78	27.7	3.2	28.03	52.7	3.4	67.34	7.7	3.6	32.93	31.8	3.7	25.67	59.9
4.9	44.19	27.4	4.2	27.67	52.5	4.4	66.93	7.9	4.6	33.19	32.0	4.7	26.75	60.1
5.9	44.68	27.2	5.2	27.31	52.4	5.4	66.47	8.2	5.6	33.44	32.2	5.7	27.83	60.2
6.9	45.24	26.9	6.2	26.95	52.2	6.4	65.98	8.4	6.6	33.68	32.5	6.7	28.90	60.4
7.9	45.86	26.6	7.2	26.60	52.0	7.4	65.46	8.7	7.6	33.90	32.8	7.7	29.93	60.6
8.9	46.53	26.3	8.2	26.27	51.8	8.4	64.90	8.9	8.6	34.11	33.1	8.7	30.89	60.8
9.9	47.22	26.1	9.2	25.97	51.5	9.4	64.32	9.1	9.6	34.30	33.4	9.7	31.78	61.0
10.9	47.91	25.9	10.2	25.70	51.3	10.4	63.75	9.2	10.6	34.46	33.6	10.7	32.60	61.3
11.9	48.57	25.7	11.2	25.46	51.1	11.4	63.20	9.4	11.6	34.61	33.9	11.7	33.35	61.5
12.9	49.20	25.5	12.2	25.23	50.9	12.4	62.68	9.5	12.6	34.75	34.2	12.7	34.06	61.7
13.9	49.77	25.3	13.1	25.01	50.7	13.4	62.20	9.6	13.6	34.89	34.4	13.7	34.78	61.9
14.9	50.30	25.1	14.1	24.78	50.5	14.4	61.75	9.8	14.6	35.04	34.7	14.7	35.52	62.1
15.9	50.82	24.9	15.1	24.53	50.3	15.4	61.30	10.0	15.6	35.21	34.9	15.7	36.30	62.2
16.9	51.36	24.7	16.1	24.27	50.1	16.4	60.84	10.1	16.6	35.40	35.1	16.7	37.12	62.4
17.9	51.94	24.4	17.1	23.99	49.9	17.4	60.37	10.3	17.6	35.59	35.4	17.6	37.99	62.6
18.9	52.58	24.2	18.1	23.70	49.7	18.4	59.86	10.4	18.6	35.78	35.6	18.6	38.89	62.8
19.9	53.28	23.9	19.1	23.40	49.5	19.4	59.30	10.6	19.6	35.97	35.9	19.6	39.81	63.0
20.9	54.05	23.7	20.1	23.10	49.3	20.4	58.69	10.8	20.6	36.14	36.2	20.6	40.70	63.3
21.9	54.87	23.5	21.1	22.82	49.0	21.3	58.05	10.9	21.6	36.30	36.5	21.6	41.54	63.5
22.9	55.74	23.3	22.1	22.57	48.7	22.3	57.39	11.0	22.6	36.43	36.9	22.6	42.32	63.8
23.9	56.62	23.1	23.1	22.35	48.5	23.3	56.73	11.1	23.6	36.53	37.2	23.6	43.02	64.1
24.9	57.47	22.9	24.1	22.15	48.2	24.3	56.09	11.2	24.6	36.62	37.5	24.6	43.63	64.4
25.9	58.30	22.8	25.1	21.97	47.9	25.3	55.48	11.3	25.6	36.70	37.8	25.6	44.17	64.6
26.9	59.09	22.6	26.1	21.82	47.6	26.3	54.89	11.4	26.6	36.77	38.1	26.6	44.68	64.9
27.9	59.84	22.5	27.1	21.69	47.4	27.3	54.34	11.4	27.6	36.83	38.4	27.6	45.18	65.1
28.9	60.56	22.3	28.1	21.54	47.1	28.3	53.82	11.5	28.6	36.90	38.6	28.6	45.69	65.4
29.9	61.26	22.2	29.1	21.38	46.9	29.3	53.30	11.6	29.6	36.99	38.9	29.6	46.22	65.6
30.9	61.98	22.0	30.1	21.22	46.7	30.3	52.77	11.7	30.6	37.09	39.2	30.6	46.80	65.8
31.9	62.75	21.8	31.1	21.04	46.5	31.3	52.21	11.8	31.6	37.18	39.4	31.6	47.42	66.1
32.9	63.57	21.7	32.1	20.85	46.2	32.3	51.62	11.9	32.6	37.28	39.7	32.6	48.05	66.3



CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>α</i> Ursæ Min. ( <i>Polaris</i> ).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	<i>δ</i> Ursæ Min.		Mean Solar Date.	<i>λ</i> Ursæ Min.	
	Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .
June	h m 1 26	° ' ° +88 49	June	h m 6 58	° ' ° +87 11	June	h m 12 14	° ' ° +88 12	June	h m 18 1	° ' ° +86 36	June	h m 19 11	° ' ° +89 0
	s	"		s	"		s	"		s	"		s	"
1.9	3.57	21.7	1.1	20.85	46.2	1.3	51.62	11.9	1.6	37.28	39.7	1.6	48.05	6.3
2.9	4.48	21.5	2.1	20.65	45.9	2.3	50.08	12.0	2.6	37.37	40.1	2.6	48.68	6.6
3.9	5.46	21.3	3.1	20.47	45.6	3.3	50.30	12.1	3.6	37.44	40.4	3.6	49.27	6.9
4.9	6.47	21.2	4.1	20.32	45.3	4.3	49.60	12.2	4.6	37.49	40.7	4.6	49.79	7.2
5.9	7.51	21.0	5.1	20.19	45.0	5.3	48.88	12.2	5.5	37.52	41.1	5.6	50.24	7.5
6.9	8.55	20.9	6.1	20.08	44.7	6.3	48.17	12.3	6.5	37.52	41.4	6.6	50.60	7.8
7.8	9.56	20.8	7.1	20.01	44.4	7.3	47.48	12.3	7.5	37.51	41.8	7.6	50.89	8.1
8.8	10.52	20.8	8.1	19.96	44.1	8.3	46.83	12.3	8.5	37.49	42.1	8.6	51.12	8.4
9.8	11.43	20.7	9.1	19.91	43.8	9.3	46.21	12.3	9.5	37.46	42.4	9.6	51.34	8.7
10.8	12.30	20.6	10.1	19.87	43.5	10.3	45.63	12.3	10.5	37.43	42.7	10.6	51.56	9.0
11.8	13.14	20.6	11.1	19.82	43.3	11.3	45.07	12.3	11.5	37.42	42.9	11.6	51.81	9.3
12.8	13.97	20.5	12.1	19.76	43.0	12.3	44.50	12.3	12.5	37.42	43.2	12.6	52.10	9.6
13.8	14.82	20.4	13.1	19.68	42.8	13.3	43.93	12.3	13.5	37.44	43.5	13.6	52.44	9.8
14.8	15.72	20.3	14.1	19.58	42.5	14.3	43.34	12.3	14.5	37.46	43.8	14.6	52.82	10.1
15.8	16.68	20.1	15.1	19.48	42.2	15.3	42.70	12.3	15.5	37.48	44.1	15.6	53.21	10.4
16.8	17.70	20.0	16.1	19.39	41.9	16.3	42.03	12.3	16.5	37.49	44.4	16.6	53.59	10.7
17.8	18.77	19.9	17.0	19.30	41.6	17.3	41.32	12.3	17.5	37.48	44.8	17.6	53.93	11.0
18.8	19.88	19.9	18.0	19.23	41.2	18.3	40.60	12.3	18.5	37.44	45.1	18.6	54.20	11.4
19.8	21.01	19.8	19.0	19.19	40.9	19.3	39.87	12.2	19.5	37.39	45.5	19.6	54.38	11.7
20.8	22.13	19.8	20.0	19.18	40.6	20.3	39.15	12.2	20.5	37.31	45.8	20.6	54.47	12.1
21.8	23.21	19.7	21.0	19.20	40.2	21.3	38.46	12.1	21.5	37.21	46.2	21.6	54.50	12.4
22.8	24.24	19.7	22.0	19.25	39.9	22.3	37.81	12.0	22.5	37.10	46.5	22.6	54.47	12.7
23.8	25.22	19.7	23.0	19.31	39.6	23.3	37.20	11.9	23.5	36.99	46.8	23.6	54.41	13.0
24.8	26.16	19.7	24.0	19.37	39.3	24.3	36.62	11.8	24.5	36.88	47.1	24.6	54.36	13.3
25.8	27.07	19.7	25.0	19.42	39.0	25.3	36.06	11.8	25.5	36.79	47.3	25.6	54.33	13.6
26.8	27.98	19.7	26.0	19.46	38.8	26.3	35.50	11.7	26.5	36.71	47.6	26.6	54.33	13.9
27.8	28.93	19.7	27.0	19.49	38.5	27.2	34.93	11.6	27.5	36.64	47.9	27.6	54.37	14.2
28.8	29.92	19.6	28.0	19.51	38.2	28.2	34.33	11.6	28.5	36.56	48.2	28.6	54.44	14.5
29.8	30.97	19.6	29.0	19.52	37.9	29.2	33.69	11.5	29.5	36.48	48.5	29.6	54.50	14.8
30.8	32.08	19.6	30.0	19.54	37.6	30.2	33.01	11.5	30.5	36.38	48.8	30.6	54.53	15.1
31.8	33.23	19.6	31.0	19.58	37.3	31.2	32.32	11.4	31.5	36.26	49.2	31.6	54.52	15.5

## CIRCUMPOLAR STARS.

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
July	h m 1 26	° ' +88 49	July	h m 6 58	° ' +87 11	July	h m 12 14	° ' +88 12	July	h m 18 1	° ' +86 36	July	h m 19 11	° ' +89 0
	s	"		s	"		s	"		s	"		s	"
1.8	33.23	19.6	1.0	19.58	37.3	1.2	32.32	11.4	1.5	36.26	49.2	1.5	54.52	15.5
2.8	34.42	19.6	2.0	19.64	36.9	2.2	31.61	11.3	2.5	36.12	49.5	2.5	54.43	15.8
3.8	35.61	19.6	3.0	19.73	36.6	3.2	30.90	11.2	3.5	35.95	49.8	3.5	54.26	16.2
4.8	36.76	19.7	4.0	19.85	36.2	4.2	30.21	11.1	4.5	35.76	50.2	4.5	54.00	16.5
5.8	37.87	19.8	5.0	19.99	35.9	5.2	29.55	10.9	5.5	35.56	50.5	5.5	53.68	16.9
6.8	38.94	19.9	6.0	20.16	35.6	6.2	28.93	10.8	6.5	35.36	50.8	6.5	53.32	17.2
7.8	39.95	19.9	6.9	20.33	35.3	7.2	28.36	10.6	7.5	35.17	51.0	7.5	52.95	17.5
8.8	40.91	20.0	7.9	20.50	35.0	8.2	27.82	10.4	8.5	34.98	51.3	8.5	52.60	17.8
9.8	41.84	20.1	8.9	20.65	34.7	9.2	27.29	10.3	9.5	34.80	51.5	9.5	52.29	18.1
10.8	42.78	20.1	9.9	20.78	34.4	10.2	26.76	10.2	10.5	34.64	51.8	10.5	52.03	18.4
11.8	43.75	20.2	10.9	20.90	34.2	11.2	26.22	10.0	11.5	34.50	52.0	11.5	51.81	18.7
12.8	44.76	20.2	11.9	21.01	33.9	12.2	25.65	9.9	12.4	34.35	52.3	12.5	51.62	19.0
13.8	45.83	20.2	12.9	21.12	33.6	13.2	25.04	9.8	13.4	34.19	52.6	13.5	51.43	19.3
14.8	46.96	20.3	13.9	21.24	33.3	14.2	24.40	9.6	14.4	34.02	52.9	14.5	51.20	19.6
15.7	48.12	20.3	14.9	21.37	32.9	15.2	23.74	9.4	15.4	33.83	53.2	15.5	50.92	20.0
16.7	49.28	20.4	15.9	21.53	32.6	16.2	23.07	9.2	16.4	33.61	53.6	16.5	50.56	20.3
17.7	50.44	20.5	16.9	21.72	32.3	17.2	22.41	9.0	17.4	33.37	53.9	17.5	50.12	20.7
18.7	51.57	20.7	17.9	21.93	31.9	18.2	21.77	8.8	18.4	33.12	54.2	18.5	49.60	21.0
19.7	52.66	20.8	18.9	22.16	31.6	19.2	21.18	8.6	19.4	32.85	54.4	19.5	49.01	21.4
20.7	53.69	21.0	19.9	22.42	31.3	20.2	20.63	8.3	20.4	32.58	54.7	20.5	48.38	21.7
21.7	54.65	21.1	20.9	22.69	31.0	21.2	20.12	8.1	21.4	32.31	54.9	21.5	47.75	22.0
22.7	55.58	21.2	21.9	22.95	30.7	22.2	19.64	7.9	22.4	32.05	55.1	22.5	47.13	22.3
23.7	56.50	21.4	22.9	23.19	30.5	23.2	19.18	7.7	23.4	31.81	55.3	23.5	46.55	22.5
24.7	57.43	21.5	23.9	23.42	30.2	24.2	18.71	7.5	24.4	31.57	55.6	24.5	46.01	22.8
25.7	58.39	21.6	24.9	23.64	30.0	25.2	18.23	7.3	25.4	31.34	55.8	25.5	45.50	23.1
26.7	59.40	21.7	25.9	23.85	29.7	26.2	17.72	7.1	26.4	31.11	56.0	26.5	45.00	23.4
27.7	60.46	21.8	26.9	24.07	29.4	27.2	17.17	6.9	27.4	30.87	56.3	27.5	44.48	23.7
28.7	61.57	22.0	27.9	24.30	29.1	28.2	16.59	6.7	28.4	30.61	56.6	28.5	43.93	24.0
29.7	62.71	22.1	28.9	24.54	28.8	29.2	15.99	6.5	29.4	30.33	56.8	29.5	43.31	24.4
30.7	63.86	22.3	29.9	24.81	28.5	30.2	15.39	6.3	30.4	30.02	57.1	30.5	42.62	24.7
31.7	64.98	22.5	30.9	25.11	28.2	31.2	14.82	6.0	31.4	29.70	57.4	31.4	41.85	25.0
32.7	66.05	22.7	31.9	25.45	27.9	32.1	14.28	5.7	32.4	29.36	57.6	32.4	41.00	25.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (H $\epsilon$ v.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.		Right Ascension.	Declination North.
Aug.	h m	°	Aug.	h m	°	Aug.	h m	°	Aug.	h m	°	Aug.	h m	°
	1 27	+88 49		6 58	+87 11		12 14	+88 11		18 1	+86 36		19 11	+89 0
	s	"		s	"		s	"		s	"		s	"
1.7	6.05	22.7	1.9	25.80	27.6	1.1	14.28	65.7	1.4	29.36	57.6	1.4	41.00	25.4
2.7	7.08	22.9	2.9	26.15	27.3	2.1	13.78	65.4	2.4	29.02	57.8	2.4	40.10	25.7
3.7	8.04	23.2	3.9	26.50	27.1	3.1	13.33	65.1	3.4	28.67	58.0	3.4	39.18	25.9
4.7	8.93	23.4	4.9	26.85	26.8	4.1	12.92	64.8	4.4	28.33	58.2	4.4	38.27	26.2
5.7	9.79	23.6	5.9	27.18	26.6	5.1	12.53	64.6	5.4	28.00	58.4	5.4	37.39	26.5
6.7	10.63	23.8	6.9	27.49	26.4	6.1	12.15	64.3	6.4	27.69	58.6	6.4	36.57	26.7
7.7	11.50	24.0	7.9	27.78	26.1	7.1	11.76	64.0	7.4	27.40	58.8	7.4	35.80	27.0
8.7	12.39	24.2	8.9	28.06	25.9	8.1	11.35	63.8	8.4	27.12	59.0	8.4	35.07	27.2
9.7	13.32	24.3	9.9	28.35	25.6	9.1	10.91	63.5	9.4	26.83	59.2	9.4	34.35	27.5
10.7	14.30	24.5	10.9	28.65	25.3	10.1	10.44	63.3	10.4	26.53	59.4	10.4	33.62	27.8
11.7	15.32	24.7	11.9	28.98	25.0	11.1	9.95	63.0	11.4	26.22	59.6	11.4	32.84	28.0
12.7	16.37	24.9	12.9	29.33	24.7	12.1	9.45	62.7	12.4	25.88	59.8	12.4	31.99	28.3
13.7	17.41	25.1	13.9	29.71	24.5	13.1	8.96	62.4	13.4	25.52	60.1	13.4	31.06	28.7
14.7	18.42	25.4	14.9	30.11	24.2	14.1	8.49	62.0	14.4	25.14	60.3	14.4	30.05	29.0
15.7	19.39	25.6	15.9	30.52	24.0	15.1	8.05	61.7	15.4	24.75	60.5	15.4	28.97	29.3
16.7	20.29	25.9	16.9	30.95	23.7	16.1	7.66	61.3	16.4	24.36	60.6	16.4	27.85	29.5
17.7	21.12	26.2	17.9	31.38	23.5	17.1	7.32	61.0	17.3	23.97	60.8	17.4	26.72	29.8
18.7	21.90	26.5	18.9	31.79	23.3	18.1	7.02	60.6	18.3	23.59	60.9	18.4	25.61	30.0
19.6	22.65	26.7	19.9	32.19	23.1	19.1	6.74	60.3	19.3	23.22	61.0	19.4	24.53	30.2
20.6	23.40	27.0	20.9	32.58	22.9	20.1	6.46	60.0	20.3	22.87	61.1	20.4	23.49	30.4
21.6	24.17	27.2	21.9	32.96	22.7	21.1	6.18	59.7	21.3	22.52	61.2	21.4	22.48	30.6
22.6	24.97	27.5	22.9	33.33	22.5	22.1	5.87	59.4	22.3	22.17	61.4	22.4	21.50	30.8
23.6	25.81	27.7	23.9	33.70	22.3	23.1	5.52	59.1	23.3	21.82	61.5	23.4	20.52	31.1
24.6	26.71	27.9	24.9	34.09	22.1	24.1	5.15	58.8	24.3	21.46	61.7	24.4	19.51	31.3
25.6	27.64	28.2	25.9	34.51	21.8	25.1	4.77	58.5	25.3	21.09	61.9	25.4	18.46	31.6
26.6	28.58	28.5	26.9	34.95	21.6	26.1	4.39	58.2	26.3	20.70	62.0	26.4	17.34	31.9
27.6	29.51	28.8	27.9	35.42	21.3	27.1	4.01	57.8	27.3	20.28	62.2	27.4	16.14	32.1
28.6	30.40	29.1	28.9	35.91	21.1	28.1	3.65	57.5	28.3	19.84	62.3	28.4	14.86	32.4
29.6	31.23	29.5	29.9	36.41	20.9	29.1	3.34	57.1	29.3	19.39	62.5	29.4	13.53	32.6
30.6	31.99	29.8	30.8	36.90	20.8	30.1	3.09	56.7	30.3	18.94	62.6	30.4	12.19	32.8
31.6	32.67	30.1	31.8	37.39	20.6	31.1	2.88	56.3	31.3	18.51	62.6	31.4	10.85	33.0
32.6	33.30	30.5	32.8	37.87	20.4	32.1	2.70	55.9	32.3	18.09	62.7	32.4	9.53	33.2

## CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Sept.	h m 1 27	° +88 49	Sept.	h m 6 58	° +87 11	Sept.	h m 12 13	° +88 11	Sept.	h m 18 1	° +86 37	Sept.	h m 19 10	° +89 0
	s	"		s	"		s	"		s	"		s	"
1.6	33.30	30.5	1.8	37.87	20.4	1.1	62.70	55.9	1.3	18.09	2.7	1.4	69.53	33.2
2.6	33.91	30.8	2.8	38.33	20.3	2.1	62.54	55.6	2.3	17.68	2.8	2.4	68.27	33.4
3.6	34.51	31.1	3.8	38.76	20.2	3.1	62.39	55.2	3.3	17.29	2.8	3.4	67.07	33.5
4.6	35.13	31.4	4.8	39.18	20.0	4.1	62.23	54.9	4.3	16.91	2.9	4.4	65.92	33.7
5.6	35.79	31.6	5.8	39.59	19.9	5.0	62.04	54.6	5.3	16.54	3.0	5.3	64.79	33.9
6.6	36.50	31.9	6.8	40.01	19.7	6.0	61.81	54.2	6.3	16.17	3.1	6.3	63.67	34.0
7.6	37.25	32.2	7.8	40.45	19.5	7.0	61.55	53.9	7.3	15.79	3.2	7.3	62.52	34.2
8.6	38.02	32.5	8.8	40.92	19.3	8.0	61.29	53.5	8.3	15.39	3.3	8.3	61.31	34.5
9.6	38.79	32.8	9.8	41.41	19.1	9.0	61.04	53.1	9.3	14.97	3.4	9.3	60.04	34.7
10.6	39.53	33.2	10.8	41.92	18.9	10.0	60.79	52.7	10.3	14.53	3.5	10.3	58.70	34.9
11.6	40.23	33.5	11.8	42.45	18.8	11.0	60.57	52.3	11.3	14.07	3.6	11.3	57.28	35.1
12.6	40.87	33.9	12.8	43.00	18.6	12.0	60.41	51.9	12.3	13.61	3.6	12.3	55.80	35.3
13.6	41.43	34.3	13.8	43.54	18.5	13.0	60.31	51.5	13.3	13.15	3.6	13.3	54.31	35.4
14.6	41.94	34.6	14.8	44.06	18.4	14.0	60.25	51.1	14.3	12.71	3.7	14.3	52.85	35.6
15.6	42.40	35.0	15.8	44.57	18.3	15.0	60.21	50.7	15.3	12.27	3.7	15.3	51.42	35.7
16.6	42.83	35.3	16.8	45.07	18.2	16.0	60.18	50.3	16.3	11.85	3.7	16.3	50.03	35.8
17.6	43.27	35.7	17.8	45.55	18.1	17.0	60.15	49.9	17.3	11.45	3.7	17.3	48.68	35.9
18.6	43.74	36.0	18.8	46.01	18.0	18.0	60.10	49.6	18.3	11.06	3.7	18.3	47.38	36.0
19.6	44.25	36.3	19.8	46.47	17.9	19.0	60.03	49.2	19.3	10.66	3.7	19.3	46.10	36.1
20.6	44.80	36.6	20.8	46.95	17.8	20.0	59.94	48.9	20.3	10.26	3.7	20.3	44.80	36.3
21.6	45.38	37.0	21.8	47.45	17.7	21.0	59.82	48.5	21.3	9.84	3.8	21.3	43.47	36.4
22.6	45.99	37.3	22.8	47.97	17.5	22.0	59.69	48.2	22.3	9.40	3.8	22.3	42.08	36.5
23.6	46.60	37.7	23.8	48.52	17.4	23.0	59.57	47.8	23.2	8.95	3.8	23.3	40.62	36.7
24.6	47.17	38.1	24.8	49.08	17.3	24.0	59.47	47.4	24.2	8.48	3.9	24.3	39.10	36.8
25.5	47.68	38.5	25.8	49.66	17.2	24.9	59.41	46.9	25.2	8.00	3.9	25.3	37.52	37.0
26.5	48.11	38.9	26.8	50.24	17.1	25.9	59.41	46.5	26.2	7.52	3.8	26.3	35.91	37.1
27.5	48.47	39.3	27.8	50.82	17.1	26.9	59.45	46.1	27.2	7.04	3.8	27.3	34.30	37.2
28.5	48.77	39.7	28.8	51.38	17.0	27.9	59.53	45.7	28.2	6.58	3.7	28.3	32.72	37.2
29.5	49.02	40.1	29.8	51.91	17.0	28.9	59.63	45.3	29.2	6.15	3.7	29.3	31.20	37.3
30.5	49.26	40.5	30.8	52.42	17.0	29.9	59.74	44.9	30.2	5.73	3.6	30.3	29.74	37.3
31.5	49.51	40.8	31.8	52.91	17.0	30.9	59.86	44.5	31.2	5.33	3.5	31.3	28.33	37.4
32.5	49.78	41.2	32.8	53.39	16.9	31.9	59.95	44.2	32.2	4.95	3.5	32.3	26.97	37.4

CIRCUMPOLAR STARS.

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Ursæ Min. (Polaris).		Mean Solar Date.	$\gamma$ Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	$\delta$ Ursæ Min.		Mean Solar Date.	$\lambda$ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '
	1 27	+88 49		6 58	+87 11		12 13	+88 11		18 0	+86 36		19 9	+89 0
	s	"		s	"		s	"		s	"		s	"
1.5	49.51	40.8	1.8	52.91	17.0	1.9	59.95	44.2	1.2	65.33	63.5	1.3	88.33	37.4
2.5	49.78	41.2	2.8	53.39	16.9	2.9	60.01	43.8	2.2	64.95	63.5	2.3	86.97	37.4
3.5	50.10	41.5	3.8	53.87	16.8	3.9	60.04	43.4	3.2	64.56	63.4	3.3	85.64	37.5
4.5	50.46	41.9	4.8	54.36	16.8	4.9	60.06	43.1	4.2	64.16	63.4	4.3	84.30	37.5
5.5	50.84	42.2	5.8	54.86	16.7	5.9	60.07	42.7	5.2	63.75	63.4	5.3	82.93	37.6
6.5	51.23	42.6	6.8	55.39	16.6	6.9	60.10	42.3	6.2	63.33	63.3	6.3	81.50	37.7
7.5	51.61	43.0	7.7	55.94	16.6	7.9	60.15	41.8	7.2	62.89	63.3	7.3	80.00	37.8
8.5	51.94	43.4	8.7	56.50	16.5	8.9	60.25	41.4	8.2	62.43	63.2	8.3	78.45	37.9
9.5	52.20	43.8	9.7	57.08	16.5	9.9	60.40	41.0	9.2	61.97	63.2	9.3	76.85	37.9
10.5	52.39	44.2	10.7	57.66	16.5	10.9	60.60	40.6	10.2	61.51	63.1	10.3	75.22	38.0
11.5	52.51	44.6	11.7	58.23	16.5	11.9	60.84	40.2	11.2	61.06	63.0	11.3	73.59	38.0
12.5	52.57	45.0	12.7	58.79	16.5	12.9	61.08	39.8	12.2	60.62	62.8	12.3	72.00	38.0
13.5	52.60	45.4	13.7	59.33	16.6	13.9	61.33	39.4	13.2	60.20	62.7	13.2	70.46	38.0
14.5	52.62	45.8	14.7	59.85	16.6	14.9	61.58	39.0	14.2	59.80	62.5	14.2	68.98	37.9
15.5	52.67	46.2	15.7	60.35	16.6	15.9	61.81	38.7	15.2	59.42	62.4	15.2	67.57	37.9
16.5	52.75	46.5	16.7	60.84	16.7	16.9	62.00	38.3	16.2	59.04	62.3	16.2	66.19	37.9
17.5	52.87	46.9	17.7	61.34	16.7	17.9	62.17	38.0	17.2	58.66	62.2	17.2	64.81	37.9
18.5	53.03	47.2	18.7	61.85	16.7	18.9	62.32	37.6	18.2	58.27	62.1	18.2	63.41	37.9
19.5	53.21	47.6	19.7	62.38	16.7	19.9	62.48	37.3	19.2	57.86	62.0	19.2	61.97	37.9
20.5	53.38	48.0	20.7	62.93	16.7	20.9	62.65	36.9	20.2	57.44	61.9	20.2	60.47	37.9
21.5	53.53	48.4	21.7	63.50	16.7	21.9	62.86	36.5	21.2	57.01	61.8	21.2	58.92	38.0
22.5	53.62	48.8	22.7	64.08	16.7	22.9	63.11	36.1	22.2	56.57	61.7	22.2	57.31	38.0
23.5	53.65	49.3	23.7	64.67	16.8	23.9	63.42	35.7	23.2	56.12	61.5	23.2	55.67	37.9
24.5	53.60	49.7	24.7	65.25	16.8	24.9	63.77	35.3	24.2	55.68	61.3	24.2	54.02	37.9
25.5	53.49	50.1	25.7	65.82	16.9	25.9	64.15	34.9	25.2	55.26	61.1	25.2	52.41	37.8
26.5	53.32	50.5	26.7	66.37	17.0	26.9	64.55	34.6	26.2	54.86	60.9	26.2	50.85	37.8
27.5	53.11	50.9	27.7	66.88	17.1	27.9	64.95	34.2	27.2	54.47	60.7	27.2	49.36	37.7
28.5	52.91	51.3	28.7	67.36	17.2	28.9	65.34	33.9	28.2	54.11	60.5	28.2	47.94	37.6
29.5	52.73	51.6	29.7	67.83	17.3	29.9	65.69	33.6	29.1	53.77	60.3	29.2	46.58	37.5
30.5	52.57	52.0	30.7	68.30	17.4	30.9	66.01	33.3	30.1	53.44	60.1	30.2	45.26	37.4
31.5	52.45	52.3	31.7	68.77	17.5	31.9	66.31	33.0	31.1	53.10	60.0	31.2	43.96	37.3
32.4	52.37	52.7	32.7	69.24	17.6	32.9	66.61	32.6	32.1	52.76	59.8	32.2	42.65	37.3

**CIRCUMPOLAR STARS.**

**APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.**

Mean Solar Date.	<i>α</i> Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hæv.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	δ Ursæ Min.		Mean Solar Date.	λ Ursæ Min.	
	Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.		Right Ascension.	Declina- tion North.
Nov.	h m	°	Nov.	h m	°	Nov.	h m	°	Nov.	h m	°	Nov.	h m	°
	1 27	+88 49		6 59	+87 11		12 14	+88 11		18 0	+86 36		19 9	+89 0
	s	"		s	"		s	"		s	"		s	"
1.4	52.37	52.7	1.7	9.24	17.6	1.9	6.61	32.6	1.1	52.76	59.8	1.2	42.65	37.3
2.4	52.31	53.0	2.7	9.73	17.6	2.9	6.91	32.2	2.1	52.40	59.6	2.2	41.30	37.2
3.4	52.24	53.4	3.7	10.24	17.7	3.9	7.22	31.9	3.1	52.03	59.5	3.2	39.89	37.1
4.4	52.13	53.8	4.7	10.78	17.8	4.9	7.58	31.5	4.1	51.64	59.3	4.2	38.42	37.1
5.4	51.96	54.2	5.7	11.32	17.9	5.9	7.99	31.1	5.1	51.25	59.1	5.2	36.92	37.0
6.4	51.73	54.6	6.7	11.86	18.0	6.9	8.44	30.7	6.1	50.87	58.9	6.2	35.39	36.9
7.4	51.42	55.0	7.7	12.40	18.1	7.9	8.93	30.4	7.1	50.50	58.7	7.2	33.86	36.8
8.4	51.05	55.4	8.7	12.92	18.3	8.9	9.45	30.0	8.1	50.14	58.4	8.2	32.36	36.7
9.4	50.63	55.8	9.7	13.41	18.5	9.9	9.98	29.7	9.1	49.79	58.1	9.2	30.92	36.5
10.4	50.18	56.1	10.7	13.88	18.7	10.9	10.50	29.4	10.1	49.47	57.9	10.2	29.55	36.3
11.4	49.75	56.5	11.6	14.33	18.8	11.9	11.01	29.2	11.1	49.17	57.6	11.2	28.24	36.2
12.4	49.35	56.8	12.6	14.77	19.0	12.9	11.48	28.9	12.1	48.89	57.3	12.2	26.99	36.0
13.4	48.99	57.1	13.6	15.21	19.1	13.9	11.92	28.6	13.1	48.60	57.1	13.2	25.78	35.8
14.4	48.66	57.5	14.6	15.65	19.3	14.9	12.34	28.4	14.1	48.31	56.9	14.2	24.56	35.7
15.4	48.37	57.8	15.6	16.10	19.4	15.9	12.76	28.1	15.1	48.01	56.7	15.2	23.32	35.6
16.4	48.09	58.1	16.6	16.57	19.5	16.9	13.19	27.8	16.1	47.69	56.4	16.2	22.04	35.4
17.4	47.79	58.5	17.6	17.05	19.7	17.9	13.65	27.5	17.1	47.37	56.2	17.1	20.71	35.3
18.4	47.44	58.9	18.6	17.54	19.8	18.9	14.14	27.1	18.1	47.03	56.0	18.1	19.33	35.2
19.4	47.03	59.2	19.6	18.05	20.0	19.8	14.67	26.8	19.1	46.69	55.7	19.1	17.92	35.0
20.4	46.55	59.6	20.6	18.55	20.2	20.8	15.26	26.5	20.1	46.36	55.4	20.1	16.50	34.9
21.4	46.00	60.0	21.6	19.03	20.4	21.8	15.88	26.2	21.1	46.04	55.1	21.1	15.11	34.7
22.4	45.39	60.3	22.6	19.49	20.6	22.8	16.52	26.0	22.1	45.74	54.8	22.1	13.76	34.5
23.4	44.73	60.7	23.6	19.92	20.9	23.8	17.16	25.7	23.1	45.47	54.5	23.1	12.49	34.2
24.4	44.07	61.0	24.6	20.32	21.1	24.8	17.79	25.5	24.1	45.23	54.2	24.1	11.32	34.0
25.4	43.42	61.3	25.6	20.70	21.3	25.8	18.40	25.2	25.1	45.01	53.9	25.1	10.23	33.7
26.4	42.79	61.6	26.6	21.06	21.6	26.8	18.98	25.0	26.1	44.80	53.6	26.1	9.18	33.5
27.4	42.21	61.9	27.6	21.42	21.8	27.8	19.53	24.8	27.1	44.60	53.3	27.1	8.17	33.3
28.4	41.66	62.1	28.6	21.78	22.0	28.8	20.06	24.6	28.1	44.39	53.0	28.1	7.17	33.1
29.4	41.14	62.4	29.6	22.15	22.2	29.8	20.58	24.3	29.1	44.17	52.8	29.1	6.16	32.9
30.4	40.62	62.7	30.6	22.53	22.3	30.8	21.11	24.1	30.1	43.94	52.5	30.1	5.10	32.7
31.4	40.08	63.0	31.6	22.93	22.5	31.8	21.67	23.8	31.1	43.70	52.2	31.1	4.00	32.5

**CIRCUMPOLAR STARS.**

APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	<i>α</i> Ursæ Min. (Polaris).		Mean Solar Date.	51 Cephei (Hev.).		Mean Solar Date.	6 Ursæ Min. (B.).		Mean Solar Date.	<i>δ</i> Ursæ Min.		Mean Solar Date.	<i>λ</i> Ursæ Min.	
	Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .		Right Ascension.	Declina- tion <i>North</i> .
Dec.	h m 1 27	° ' +88 50	Dec.	h m 6 59	° ' +87 11	Dec.	h m 12 14	° ' +88 11	Dec.	h m 18 0	° ' +86 36	Dec.	h m 19 8	° ' +89 0
	s "			s "			s "			s "			s "	
1.4	40.08	3.0	1.6	22.93	22.5	1.8	21.67	23.8	1.1	43.70	52.2	1.1	64.00	32.5
2.4	39.49	3.4	2.6	23.34	22.7	2.8	22.28	23.6	2.1	43.46	51.9	2.1	62.85	32.3
3.4	38.84	3.7	3.6	23.76	23.0	3.8	22.93	23.3	3.0	43.22	51.6	3.1	61.68	32.1
4.4	38.11	4.0	4.6	24.17	23.2	4.8	23.63	23.1	4.0	42.98	51.3	4.1	60.51	31.9
5.4	37.31	4.3	5.6	24.56	23.5	5.8	24.36	22.8	5.0	42.76	51.0	5.1	59.38	31.6
6.4	36.47	4.6	6.6	24.92	23.8	6.8	25.10	22.6	6.0	42.56	50.6	6.1	58.31	31.4
7.3	35.60	4.9	7.6	25.25	24.1	7.8	25.83	22.5	7.0	42.39	50.2	7.1	57.31	31.1
8.3	34.73	5.1	8.6	25.57	24.4	8.8	26.55	22.3	8.0	42.24	49.9	8.1	56.38	30.8
9.3	33.88	5.4	9.6	25.86	24.7	9.8	27.23	22.2	9.0	42.10	49.5	9.1	55.52	30.5
10.3	33.08	5.6	10.6	26.14	24.9	10.8	27.87	22.0	10.0	41.96	49.2	10.1	54.72	30.2
11.3	32.32	5.8	11.6	26.42	25.2	11.8	28.49	21.9	11.0	41.83	48.9	11.1	53.95	29.9
12.3	31.60	6.0	12.6	26.71	25.4	12.8	29.09	21.8	12.0	41.70	48.6	12.1	53.17	29.7
13.3	30.90	6.3	13.6	27.01	25.7	13.8	29.69	21.6	13.0	41.56	48.3	13.1	52.36	29.4
14.3	30.20	6.5	14.6	27.32	25.9	14.8	30.31	21.4	14.0	41.40	48.0	14.1	51.51	29.2
15.3	29.48	6.8	15.6	27.65	26.2	15.8	30.96	21.3	15.0	41.24	47.7	15.1	50.62	28.9
16.3	28.70	7.0	16.6	27.98	26.4	16.8	31.64	21.1	16.0	41.07	47.4	16.1	49.69	28.7
17.3	27.85	7.3	17.6	28.30	26.7	17.8	32.37	20.9	17.0	40.91	47.0	17.1	48.75	28.4
18.3	26.93	7.6	18.6	28.61	27.0	18.8	33.14	20.8	18.0	40.76	46.6	18.1	47.83	28.1
19.3	25.96	7.8	19.5	28.90	27.4	19.8	33.93	20.7	19.0	40.63	46.3	19.1	46.97	27.8
20.3	24.94	8.0	20.5	29.16	27.7	20.8	34.72	20.6	20.0	40.52	45.9	20.1	46.18	27.5
21.3	23.90	8.2	21.5	29.38	28.0	21.8	35.50	20.5	21.0	40.44	45.5	21.0	45.48	27.1
22.3	22.87	8.4	22.5	29.57	28.4	22.8	36.26	20.4	22.0	40.39	45.1	22.0	44.87	26.8
23.3	21.87	8.6	23.5	29.74	28.7	23.8	36.99	20.3	22.9	40.36	44.8	23.0	44.34	26.5
24.3	20.91	8.7	24.5	29.91	29.0	24.8	37.68	20.3	23.9	40.34	44.4	24.0	43.86	26.1
25.3	19.99	8.8	25.5	30.07	29.3	25.7	38.34	20.2	24.9	40.33	44.1	25.0	43.41	25.8
26.3	19.11	9.0	26.5	30.24	29.5	26.7	38.98	20.1	25.9	40.31	43.8	26.0	42.96	25.5
27.3	18.25	9.1	27.5	30.42	29.8	27.7	39.62	20.1	26.9	40.27	43.5	27.0	42.48	25.3
28.3	17.39	9.3	28.5	30.61	30.1	28.7	40.28	20.0	27.9	40.22	43.2	28.0	41.97	25.0
29.3	16.50	9.5	29.5	30.81	30.4	29.7	40.97	19.9	28.9	40.17	42.8	29.0	41.41	24.7
30.3	15.56	9.7	30.5	31.01	30.7	30.7	41.70	19.8	29.9	40.11	42.5	30.0	40.83	24.4
31.3	14.55	9.8	31.5	31.21	31.0	31.7	42.47	19.7	30.9	40.07	42.2	31.0	40.25	24.1
32.3	13.48	10.0	32.5	31.39	31.3	32.7	43.26	19.6	31.9	40.03	41.8	32.0	39.70	23.8

# FIXED STARS, 1910.

(CONSTANTS OF PARIS CONFERENCE)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	43 Cephei (H.).		$\mu$ Hydri.		47 Cephei (H.).		$\delta$ Mensæ.		Groombridge 944.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.
	h m 0 55	° ' " +85 46	h m 2 33	° ' " -79 29	h m 2 53	° ' " +79 3	h m 4 23	° ' " -80 25	h m 5 32	° ' " +85 9
Jan. 0.4	72.64	44.4	38.23	88.3	65.60	65.0	70.69	42.1	71.07	22.5
10.3	69.74	44.9	37.09	89.1	64.80	66.9	69.70	44.4	70.72	25.7
20.3	66.82	44.8	35.90	89.3	63.88	68.3	68.54	46.2	69.87	28.7
30.3	63.99	44.1	34.68	88.9	62.87	69.1	67.24	47.5	68.56	31.4
Feb. 9.2	61.36	42.8	33.46	87.9	61.82	69.3	65.84	48.3	66.85	33.6
19.2	59.03	40.9	32.29	86.4	60.76	68.8	64.39	48.5	64.82	35.3
Mar. 1.2	57.10	38.5	31.19	84.3	59.75	67.8	62.91	48.1	62.55	36.5
11.2	55.64	35.8	30.19	81.8	58.83	66.3	61.45	47.2	60.16	37.1
21.1	54.69	32.9	29.31	78.9	58.05	64.3	60.05	45.8	57.74	37.1
31.1	54.30	29.8	28.58	75.6	57.43	61.9	58.73	43.9	55.40	36.5
Apr. 10.1	54.47	26.8	28.02	72.1	57.00	59.3	57.54	41.5	53.23	35.3
20.1	55.19	23.9	27.64	68.4	56.77	56.6	56.50	38.8	51.32	33.7
30.0	56.43	21.2	27.45	64.6	56.77	53.8	55.63	35.8	49.75	31.6
May 10.0	58.13	18.9	27.45	60.8	56.99	51.1	54.95	32.5	48.58	29.1
20.0	60.24	17.0	27.65	57.1	57.42	48.5	54.48	29.1	47.83	26.4
29.9	62.69	15.6	28.04	53.5	58.05	46.2	54.23	25.5	47.54	23.6
June 8.9	65.38	14.7	28.62	50.1	58.86	44.2	54.21	21.9	47.72	20.7
18.9	68.25	14.3	29.36	47.1	59.82	42.6	54.41	18.4	48.35	17.8
28.9	71.21	14.5	30.25	44.4	60.91	41.4	54.82	15.1	49.42	15.0
July 8.8	74.19	15.2	31.27	42.2	62.10	40.7	55.44	12.0	50.91	12.4
18.8	77.10	16.5	32.39	40.5	63.36	40.5	56.25	9.2	52.78	10.1
28.8	79.89	18.3	33.57	39.3	64.66	40.8	57.23	6.8	54.98	8.0
Aug. 7.8	82.48	20.6	34.78	38.7	65.98	41.5	58.34	4.9	57.47	6.3
17.7	84.83	23.3	35.99	38.7	67.28	42.7	59.55	3.6	60.19	5.0
27.7	86.88	26.3	37.15	39.4	68.54	44.4	60.82	2.8	63.10	4.1
Sept. 6.7	88.60	29.7	38.22	40.6	69.74	46.5	62.12	2.6	66.14	3.6
16.6	89.94	33.3	39.18	42.4	70.85	48.9	63.40	3.1	69.25	3.6
26.6	90.88	37.0	39.99	44.6	71.86	51.7	64.61	4.1	72.37	4.1
Oct. 6.6	91.40	40.9	40.62	47.3	72.75	54.8	65.72	5.8	75.43	5.0
16.6	91.48	44.8	41.05	50.2	73.49	58.1	66.68	8.0	78.38	6.3
26.5	91.10	48.6	41.27	53.4	74.07	61.5	67.45	10.6	81.16	8.1
Nov. 5.5	90.28	52.2	41.26	56.6	74.49	65.0	68.02	13.6	83.70	10.3
15.5	89.02	55.6	41.03	59.7	74.72	68.5	68.35	16.8	85.94	12.8
25.5	87.34	58.7	40.58	62.6	74.76	71.9	68.43	20.1	87.81	15.7
Dec. 5.4	85.27	61.3	39.94	65.3	74.61	75.2	68.26	23.4	89.27	18.8
15.4	82.88	63.5	39.12	67.5	74.26	78.2	67.84	26.6	90.26	22.0
25.4	80.23	65.1	38.15	69.2	73.73	80.8	67.18	29.5	90.76	25.4
35.3	77.41	66.0	37.06	70.4	73.03	83.0	66.31	32.1	90.75	28.6



# FIXED STARS, 1910.

551

(CONSTANTS OF PARIS CONFERENCE.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Mensæ.		25 Camelop. (H.).		ι Draconis (H.).		ζ Chamæleontis.		δ <sup>a</sup> Chamæleontis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 6 47	° -80 42	h m 7 12	° +82 34	h m 9 24	° +81 43	h m 9 36	° -80 31	h m 10 44	° -80 3
	"	"	"	"	"	"	"	"	"	"
Jan. 0.6	42.75	64.8	19.55	76.1	25.61	24.2	39.16	52.5	59.17	31.5
	0.30	3.5	0.56	3.1	1.27	2.0	0.71	3.3	1.02	2.8
10.6	42.45	68.3	20.11	79.2	26.88	26.2	39.87	55.8	60.19	34.3
	0.56	3.3	0.21	3.1	1.02	2.5	0.49	3.6	0.84	3.2
20.5	41.89	71.6	20.32	82.3	27.90	28.7	40.36	59.4	61.03	37.5
	0.79	3.1	0.14	3.1	0.74	2.8	0.25	3.8	0.65	3.5
30.5	41.10	74.7	20.18	85.4	28.64	31.5	40.61	63.2	61.68	41.0
	1.01	2.8	0.48	2.9	0.44	3.0	0.02	3.9	0.45	3.8
Feb. 9.5	40.09	77.5	19.70	88.3	29.08	34.5	40.63	67.1	62.13	44.8
	1.19	2.4	0.78	2.7	0.13	3.1	0.22	3.9	0.24	3.9
	19.5	38.90	79.9	18.92	91.0	29.21	37.6	40.41	71.0	62.37
	1.34	1.9	1.05	2.2	0.18	3.0	0.44	3.7	0.02	48.7
Mar. 1.4	37.56	81.8	17.87	93.2	29.03	40.6	39.97	74.7	62.39	52.6
	1.44	1.5	1.26	1.8	0.47	2.9	0.64	3.5	0.18	3.9
11.4	36.12	83.3	16.61	95.0	28.56	43.5	39.33	78.2	62.21	56.5
	1.52	1.0	1.42	1.3	0.72	2.6	0.82	3.3	0.37	3.8
21.4	34.60	84.3	15.19	96.3	27.84	46.1	38.51	81.5	61.84	60.3
	1.55	0.4	1.50	0.7	0.94	2.2	0.99	2.9	0.55	3.5
31.3	33.05	84.7	13.69	97.0	26.90	48.3	37.52	84.4	61.29	63.8
	1.54	0.1	1.52	0.1	1.10	1.8	1.11	2.5	0.71	3.2
Apr. 10.3	31.51	84.6	12.17	97.1	25.80	50.1	36.41	86.9	60.58	67.0
	1.50	0.6	1.48	0.4	1.23	1.2	1.21	2.0	0.85	2.9
20.3	30.01	84.0	10.69	96.7	24.57	51.3	35.20	88.9	59.73	69.9
	1.42	1.1	1.37	1.0	1.29	0.7	1.28	1.6	0.97	2.4
30.3	28.59	82.9	9.32	95.7	23.28	52.0	33.92	90.5	58.76	72.3
	1.32	1.5	1.22	1.5	1.30	0.1	1.33	1.1	1.06	2.0
May 10.2	27.27	81.4	8.10	94.2	21.98	52.1	32.59	91.6	57.70	74.3
	1.18	2.0	1.01	1.9	1.26	0.4	1.34	0.5	1.13	1.5
20.2	26.09	79.4	7.09	92.3	20.72	51.7	31.25	92.1	56.57	75.8
	1.01	2.4	0.77	2.3	1.18	1.0	1.32	0.0	1.17	1.0
	30.2	25.08	77.0	6.32	90.0	50.7	29.93	92.1	55.40	76.8
	0.82	2.8	0.51	2.6	1.06	1.5	1.26	0.6	1.19	0.4
June 9.2	24.26	74.2	5.81	87.4	18.48	49.2	28.67	91.5	54.21	77.2
	0.62	3.0	0.23	2.8	0.91	1.9	1.18	1.1	1.17	0.1
19.1	23.64	71.2	5.58	84.6	17.57	47.3	27.49	90.4	53.04	77.1
	0.40	3.2	0.05	3.0	0.72	2.4	1.08	1.6	1.13	0.7
29.1	23.24	68.0	5.63	81.6	16.85	44.9	26.41	88.8	51.91	76.4
	0.17	3.3	0.34	3.0	0.53	2.7	0.94	2.1	1.06	1.2
July 9.1	23.07	64.7	5.97	78.6	16.32	42.2	25.47	86.7	50.85	75.2
	0.07	3.3	0.62	3.0	0.31	3.0	0.78	2.4	0.95	1.7
	19.0	23.14	61.4	6.59	75.6	16.01	39.2	24.69	84.3	49.90
	0.30	3.2	0.88	2.9	0.08	3.2	0.59	2.7	0.82	2.2
29.0	23.44	58.2	7.47	72.7	15.93	36.0	24.10	81.6	49.08	71.3
	0.52	3.0	1.13	2.8	0.14	3.3	0.39	3.0	0.67	2.5
Aug. 8.0	23.06	55.2	8.60	69.9	16.07	32.7	23.71	78.6	48.41	68.8
	0.73	2.7	1.36	2.5	0.36	3.5	0.16	3.1	0.48	2.8
18.0	24.69	52.5	9.96	67.4	16.43	29.2	23.55	75.5	47.93	66.0
	0.92	2.4	1.56	2.2	0.59	3.4	0.07	3.1	0.28	3.0
27.9	25.61	50.1	11.52	65.2	17.02	25.8	23.62	72.4	47.65	63.0
	1.08	1.9	1.72	2.0	0.80	3.4	0.30	3.1	0.06	3.0
	26.69	48.2	13.24	63.2	17.82	22.4	23.92	69.3	47.59	60.0
	1.21	1.4	1.86	1.6	1.01	3.2	0.53	2.8	0.17	3.1
16.9	27.90	46.8	15.10	61.6	18.83	19.2	24.45	66.5	47.76	56.9
	1.29	0.8	1.98	1.2	1.20	3.0	0.75	2.5	0.39	2.9
26.9	29.19	51.6	17.08	60.4	20.03	16.2	25.20	64.0	48.15	54.0
	1.34	0.1	2.05	0.8	1.37	2.7	0.94	2.1	0.62	2.6
Oct. 6.8	30.53	45.9	19.13	59.6	21.40	13.5	26.14	61.9	48.77	51.4
	1.33	0.5	2.08	0.3	1.52	2.4	1.11	1.7	0.82	2.3
16.8	31.86	46.4	21.21	59.3	22.92	11.1	27.25	60.2	49.59	49.1
	1.28	1.2	2.08	0.2	1.64	2.0	1.24	1.0	1.00	1.8
	26.8	33.14	47.6	23.29	59.5	9.1	28.49	59.2	50.59	47.3
	1.18	1.7	2.03	0.6	1.74	1.5	1.33	0.4	1.15	1.2
Nov. 5.7	34.32	49.3	25.32	60.1	26.30	7.6	29.82	58.8	51.74	46.1
	1.04	2.3	1.94	1.1	1.80	1.0	1.37	0.3	1.26	0.7
15.7	35.36	51.6	27.26	61.2	28.10	6.6	31.19	59.1	53.00	45.4
	0.85	2.8	1.80	1.6	1.82	0.5	1.35	0.9	1.32	0.0
25.7	36.21	54.4	29.06	62.8	29.92	6.1	32.54	60.0	54.32	45.4
	0.63	3.1	1.60	2.0	1.79	0.1	1.29	1.5	1.34	0.7
Dec. 5.7	36.84	57.5	30.66	64.8	31.71	6.2	33.83	61.5	55.66	46.1
	0.38	3.4	1.37	2.4	1.72	0.7	1.19	2.2	1.31	1.4
	15.6	37.22	60.9	32.03	67.2	6.9	35.02	63.7	56.97	47.5
	0.13	3.5	1.09	2.7	1.58	1.2	1.03	2.7	1.23	1.9
25.6	37.35	64.4	33.12	69.9	35.01	8.1	36.05	66.4	58.20	49.4
	0.15	3.6	0.77	3.0	1.40	1.7	0.85	3.1	1.11	2.5
35.6	37.20	68.0	33.89	72.9	36.41	9.8	36.90	69.5	59.31	51.9

## FIXED STARS, 1910.

(CONSTANTS OF PARIS CONFERENCE.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\eta$ Octantis.		$\beta$ Chamæleontis.		32 <sup>a</sup> Camelop. (H.)		$\kappa$ Octantis.		$\delta$ Octantis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 10 59	° ' " 84 6	h m 12 12	° ' " 78 48	h m 12 48	° ' " 83 53	h m 13 25	° ' " 85 19	h m 14 12	° ' " 83 15
Jan. 0.7	61.21 s	10.0	61.30 s	19.5	28.64 s	52.3	62.47 s	7.5	14.20 s	1.9
10.7	62.94 1.73	12.6 2.6	62.49 1.19	21.3 1.8	30.86 2.22	51.7 0.6	65.40 2.93	8.1 0.6	16.27 2.07	1.9 0.0
20.7	64.41 1.47	15.6 3.0	63.59 1.10	23.6 2.3	33.06 2.20	51.7 0.0	68.29 2.89	9.3 1.2	18.39 2.12	2.4 0.5
30.7	65.58 1.17	19.0 3.4	64.58 0.99	26.4 2.8	35.16 2.10	52.3 0.6	71.06 2.77	11.0 1.7	20.50 2.11	3.5 1.1
Feb. 9.6	66.42 0.84	22.6 3.6	65.43 0.85	29.6 3.2	37.09 1.93	53.6 1.3	73.65 2.59	13.3 2.3	22.53 2.03	5.2 1.7
	0.50	3.9	0.70	3.5	1.70	1.9	2.34	2.7	1.92	2.1
19.6	66.92 0.15	26.5 3.9	66.13 0.53	33.1 3.7	38.79 1.40	55.5 2.3	75.99 2.05	16.0 3.1	24.45 1.76	7.3 2.6
Mar. 1.6	67.07 0.18	30.4 3.9	66.66 0.36	36.8 3.7	40.19 1.05	57.8 2.7	78.04 1.71	19.1 3.4	26.21 1.57	9.9 2.9
11.5	66.89 0.51	34.3 3.9	67.02 0.19	40.6 3.8	41.24 1.05	60.5 3.0	79.75 1.35	22.5 3.6	27.78 1.35	12.8 3.2
21.5	66.38 0.82	38.2 3.6	67.21 0.02	44.5 3.8	41.92 0.30	63.5 3.1	81.10 0.97	26.1 3.8	29.13 1.10	16.0 3.4
31.5	65.56 1.09	41.8 3.4	67.23 0.15	48.3 3.7	42.22 0.09	66.6 3.0	82.07 0.57	29.9 3.8	30.23 0.84	19.4 3.6
Apr. 10.5	64.47 1.35	45.2 3.1	67.08 0.30	52.0 3.5	42.13 0.45	69.6 3.0	82.64 0.17	33.7 3.7	31.07 0.58	23.0 3.7
20.4	63.12 1.57	48.3 2.7	66.78 0.44	55.5 3.3	41.68 0.79	72.6 2.8	82.81 0.23	37.4 3.7	31.65 0.30	26.7 3.6
30.4	61.55 1.75	51.0 2.3	66.34 0.58	58.8 2.9	40.89 1.10	75.4 2.4	82.58 0.61	41.1 3.7	31.95 0.02	30.3 3.5
May 10.4	59.80 1.89	53.3 1.8	65.76 0.70	61.7 2.5	39.79 1.35	77.8 2.0	81.97 0.98	44.6 3.5	31.97 0.26	33.8 3.4
20.4	57.91 1.99	55.1 1.3	65.06 0.80	64.2 2.1	38.44 1.56	79.8 1.5	80.99 1.34	47.9 2.9	31.71 0.53	37.2 3.2
30.3	55.92 2.04	56.4 0.7	64.26 0.88	66.3 1.5	36.88 1.72	81.3 1.0	79.65 1.65	50.8 2.5	31.18 0.79	40.4 2.9
June 9.3	53.88 2.04	57.1 0.1	63.38 0.94	67.8 1.1	35.16 1.81	82.3 0.5	78.00 1.92	53.3 2.5	30.39 1.02	43.3 2.4
19.3	51.84 1.99	57.2 0.4	62.44 0.97	68.9 0.5	33.35 1.86	82.8 0.1	76.08 2.1	55.4 2.6	29.37 1.23	45.7 2.1
29.2	49.85 1.89	56.8 0.9	61.47 0.98	69.4 0.1	31.49 1.86	82.7 0.7	73.93 2.31	57.0 1.1	28.14 1.41	47.8 1.6
July 9.2	47.96 1.74	55.9 1.4	60.49 0.96	69.3 0.6	29.63 1.81	82.0 1.2	71.62 2.42	58.1 0.5	26.73 1.54	49.4 1.1
19.2	46.22 1.54	54.5 1.9	59.53 0.92	68.7 1.1	27.82 1.72	80.8 1.7	69.20 2.44	58.6 0.0	25.19 1.62	50.5 0.5
29.2	44.68 1.28	52.6 1.9	58.61 0.83	67.6 1.6	26.10 1.58	79.1 2.2	66.76 2.39	58.6 0.6	23.57 1.65	51.0 0.0
Aug. 8.1	43.40 0.98	50.2 2.4	57.78 0.73	66.0 2.1	24.52 1.42	76.9 2.6	64.37 2.26	58.0 1.2	21.92 1.64	51.0 0.6
18.1	42.42 0.65	47.6 2.9	57.05 0.59	63.9 2.4	23.10 1.22	74.3 3.0	62.11 2.05	56.8 1.7	20.28 1.55	50.4 1.2
28.1	41.77 0.28	44.7 3.1	56.46 0.43	61.5 2.8	21.88 0.98	71.3 3.4	60.06 1.75	55.1 2.1	18.73 1.41	49.2 1.7
Sept. 7.1	41.49 0.11	41.6 3.0	56.03 0.25	58.7 2.9	20.90 0.73	67.9 3.6	58.31 1.39	53.0 2.5	17.32 1.21	47.5 2.1
17.0	41.60 0.49	38.6 3.0	55.78 0.04	55.8 3.0	20.17 0.44	64.3 3.8	56.92 0.96	50.5 2.8	16.11 0.95	45.4 2.5
27.0	42.09 0.87	35.6 3.0	55.74 0.16	52.8 2.9	19.73 0.14	60.5 3.9	55.96 0.49	47.7 3.0	15.16 0.65	42.9 2.7
Oct. 7.0	42.96 1.23	32.8 2.5	55.90 0.38	49.9 2.8	19.59 0.17	56.6 3.9	55.47 0.02	44.7 3.0	14.51 0.32	40.2 2.9
16.9	44.19 1.54	30.3 2.0	56.28 0.59	47.1 2.5	19.76 0.49	52.7 3.9	55.49 0.54	41.7 3.0	14.19 0.04	37.3 3.0
26.9	45.73 1.81	28.3 1.5	56.87 0.78	44.6 2.2	20.25 0.81	48.8 3.7	56.03 1.04	38.7 2.8	14.23 0.41	34.3 2.9
Nov. 5.9	47.54 2.01	26.8 0.9	57.65 0.94	42.4 1.6	21.06 1.13	45.1 3.5	57.07 1.53	35.9 2.5	14.64 0.78	31.4 2.8
15.9	49.55 2.13	25.9 0.3	58.59 1.08	40.8 1.1	22.19 1.42	41.6 3.2	58.60 1.97	33.4 2.1	15.42 1.12	28.6 2.4
25.8	51.68 2.19	25.6 0.4	59.67 1.18	39.7 0.5	23.61 1.69	38.4 2.8	60.57 2.33	31.3 1.6	16.54 1.42	26.2 2.0
Dec. 5.8	53.87 2.16	26.0 1.0	60.85 1.24	39.2 0.1	25.30 1.91	35.6 2.3	62.90 2.61	29.7 1.0	17.96 1.69	24.2 1.6
15.8	56.03 2.05	27.0 1.7	62.09 1.25	39.3 0.8	27.21 2.07	33.3 1.7	65.51 2.82	28.7 0.4	19.65 1.89	22.6 1.0
25.8	58.08 1.89	28.7 2.2	63.34 1.23	40.1 1.4	29.28 2.18	31.6 1.0	68.33 2.92	28.3 0.2	21.54 2.04	21.6 0.5
35.7	59.97	30.9	64.57	41.5	31.46	30.6	71.25	28.5	23.58	21.1

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	$\alpha$ Apodis.		$\rho$ Octantis.		$\gamma$ Apodis.		$\epsilon$ Ursæ Minoris.		$\sigma$ Octantis.	
	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.
	h m 14 36	° ' " -78 39	h m 15 22	° ' " -84 9	h m 16 19	° ' " -78 41	h m 16 54	° ' " +82 10	h 19	° ' " -89 14
Jan. 0.9	31.48 s	29.0 s	9.26 s	45.8 s	28.03 s	37.0 s	62.63 s	61.6 m s	14 21.8 m s	26.2 m s
10.9	32.75 1.27	28.7 0.3	11.50 2.24	44.7 1.1	29.10 1.07	35.3 1.7	63.32 0.69	58.3 3.3	14 25.2 3.4	22.8 3.4
20.9	34.07 1.32	29.0 0.3	13.91 2.41	44.2 0.5	30.30 1.20	34.1 1.2	64.28 0.96	55.3 3.0	14 31.6 6.4	19.5 3.3
30.8	35.40 1.33	29.8 0.8	16.41 2.50	44.2 0.0	31.59 1.29	33.3 0.8	65.48 1.20	52.7 2.6	14 40.9 9.3	16.3 3.2
Feb. 9.8	36.70 1.30	31.2 1.4	18.95 2.54	44.7 0.5	32.94 1.35	33.0 0.3	66.87 1.39	50.7 2.0	14 52.8 11.9	13.4 2.9
	1.24	1.8	2.52	1.1	1.38	0.2	1.53	1.4	14.1	2.6
19.8	37.94 1.17	33.0 2.3	21.47 2.43	45.8 1.5	34.32 1.38	33.2 0.7	68.40 1.60	49.3 0.8	15 6.9 15.9	10.8 2.3
Mar. 1.8	39.11 1.06	35.3 2.6	23.90 2.29	47.3 2.0	35.70 1.35	33.9 1.1	70.00 1.62	48.5 0.1	15 22.8 17.4	8.5 1.8
11.7	40.17 0.94	37.9 2.9	26.19 2.12	49.3 2.4	37.05 1.29	35.0 1.6	71.62 1.58	48.4 0.5	15 40.2 19.1	6.7 1.4
21.7	41.11 0.80	40.8 3.2	28.31 1.90	51.7 2.7	38.34 1.21	36.6 1.9	73.20 1.48	48.9 1.2	15 58.6 19.3	5.3 0.4
31.7	41.91 0.66	44.0 3.4	30.21 1.64	54.4 3.0	39.55 1.11	38.5 2.3	74.68 1.33	50.1 1.7	16 17.7 19.3	4.3 0.4
Apr. 10.6	42.57 0.50	47.4 3.4	31.85 1.37	57.4 3.2	40.66 1.00	40.8 2.5	76.01 1.13	51.8 2.2	16 37.0 19.2	3.9 0.0
20.6	43.07 0.34	50.8 3.5	33.22 1.06	60.6 3.4	41.66 0.86	43.3 2.8	77.14 0.91	54.0 2.6	16 56.2 18.7	3.9 0.5
30.6	43.41 0.18	54.3 3.4	34.28 0.74	64.0 3.4	42.52 0.71	46.1 3.0	78.05 0.65	56.6 2.8	17 14.9 17.7	4.4 1.0
May 10.6	43.59 0.01	57.7 3.3	35.02 0.40	67.4 3.5	43.23 0.54	49.1 3.0	78.70 0.37	59.4 3.1	17 32.6 16.5	5.4 1.5
20.5	43.60 0.16	61.0 3.1	35.42 0.07	70.9 3.3	43.77 0.37	52.1 3.1	79.07 0.10	62.5 3.1	17 49.1 14.9	6.9 1.8
30.5	43.44 0.31	64.1 2.9	35.49 0.28	74.2 3.2	44.14 0.19	55.2 3.1	79.17 0.18	65.6 3.1	18 4.0 12.9	8.7 2.2
June 9.5	43.13 0.47	67.0 2.5	35.21 0.61	77.4 3.0	44.33 0.01	58.3 3.0	78.99 0.46	68.7 3.0	18 16.9 10.7	10.9 2.6
19.5	42.66 0.60	69.5 2.2	34.60 0.92	80.4 2.7	44.34 0.18	61.3 2.8	78.53 0.72	71.7 2.8	18 27.6 8.2	13.5 2.8
29.4	42.06 0.73	71.7 1.7	33.68 1.21	83.1 2.3	44.16 0.35	64.1 2.6	77.81 0.96	74.5 2.6	18 35.8 5.5	16.3 3.0
July 9.4	41.33 0.83	73.4 1.3	32.47 1.46	85.4 1.9	43.81 0.52	66.7 2.3	76.85 1.18	77.1 2.2	18 41.3 2.7	19.3 3.1
19.4	40.50 0.90	74.7 0.7	31.01 1.67	87.3 1.4	43.29 0.66	69.0 1.9	75.67 1.37	79.3 1.8	18 44.0 0.3	22.4 3.0
29.3	39.60 0.94	75.4 0.2	29.34 1.82	88.7 0.9	42.63 0.79	70.9 1.4	74.30 1.53	81.1 1.4	18 43.7 3.2	25.4 3.0
Aug. 8.3	38.66 0.96	75.6 0.3	27.52 1.91	89.6 0.3	41.84 0.89	72.3 1.0	72.77 1.65	82.5 0.9	18 40.5 8.6	28.4 2.8
18.3	37.70 0.93	75.3 0.9	25.61 1.92	89.9 0.2	40.95 0.95	73.3 0.4	71.12 1.74	83.4 0.4	18 34.5 10.9	31.2 2.5
28.3	36.77 0.87	74.4 1.4	23.69 1.88	89.7 0.8	40.00 0.97	73.7 0.1	69.38 1.79	83.8 0.1	18 25.9 15.1	33.7 2.2
Sept. 7.2	35.90 0.76	73.0 1.9	21.81 1.75	88.9 1.4	39.03 0.96	73.6 0.6	67.59 1.80	83.7 0.6	18 15.0 12.9	35.9 1.7
17.2	35.14 0.63	71.1 2.2	20.06 1.54	87.5 1.8	38.07 0.90	73.0 1.1	65.79 1.77	83.1 1.1	18 2.1 14.3	37.6 1.1
27.2	34.51 0.46	68.9 2.6	18.52 1.27	85.7 2.3	37.17 0.81	71.9 1.7	64.02 1.70	82.0 1.6	17 47.8 15.2	38.7 0.6
Oct. 7.2	34.05 0.27	66.3 2.7	17.25 0.95	83.4 2.6	36.36 0.67	70.2 2.1	62.32 1.58	80.4 2.0	17 32.6 15.4	39.3 0.1
17.1	33.78 0.06	63.6 2.9	16.30 0.56	80.8 2.8	35.69 0.49	68.1 2.4	60.74 1.42	78.4 2.5	17 17.2 15.1	39.2 0.7
27.1	33.72 0.17	60.7 2.9	15.74 0.15	78.0 3.0	35.20 0.30	65.7 2.6	59.32 1.22	75.9 2.8	17 2.1 14.1	38.5 1.3
Nov. 6.1	33.89 0.40	57.8 2.7	15.59 0.28	75.0 3.0	34.90 0.08	63.1 2.8	58.10 0.99	73.1 3.2	16 48.0 12.6	37.2 1.8
16.0	34.29 0.61	55.1 2.5	15.87 0.71	72.0 2.9	34.82 0.15	60.3 2.9	57.11 0.72	69.9 3.5	16 35.4 10.4	35.4 2.4
26.0	34.90 0.81	52.6 2.1	16.58 1.12	69.1 2.6	34.97 0.38	57.4 2.8	56.39 0.43	66.4 3.6	16 25.0 7.8	33.0 2.8
Dec. 6.0	35.71 0.98	50.5 1.7	17.70 1.51	66.5 2.3	35.35 0.60	54.6 2.6	55.96 0.13	62.8 3.7	16 17.2 5.0	30.2 3.1
16.0	36.69 1.13	48.8 1.2	19.21 1.84	64.2 2.0	35.95 0.81	52.0 2.3	55.83 0.19	59.1 3.6	16 12.2 1.8	27.1 3.3
25.9	37.82 1.23	47.6 0.6	21.05 2.12	62.2 1.4	36.76 0.98	49.7 2.0	56.02 0.50	55.5 3.5	16 10.4 1.4	23.8 3.4
35.9	39.05	47.0	23.17	60.8	37.74	47.7	56.52	52.0	16 11.8	20.4

# FIXED STARS, 1910.

(CONSTANTS OF PARIS CONFERENCE.)

## APPARENT PLACES FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	12 Year Cat. 1879.		$\lambda^1$ Octantis.		$\nu$ Octantis.		$\beta$ Octantis.		$\gamma^1$ Octantis.	
	Right Ascension.	Declina- tion North.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.	Right Ascension.	Declina- tion South.
	h m 20 51	° +80 12	h m 21 37	° -83 7	h m 22 14	° -86 25	h m 22 36	° -81 50	h m 23 46	° -82 30
Jan. 1.2	35.28 s	59.3 "	3.22 s	82.3 "	28.32 s	57.0 "	49.36 s	98.0 "	49.31 s	94.5 "
11.1	34.56 0.72	56.5 2.8	2.52 0.70	79.3 3.0	26.35 1.97	54.2 2.8	48.42 0.94	95.6 2.4	47.92 1.39	92.8 1.7
21.1	34.06 0.50	53.3 3.2	2.12 0.40	76.0 3.3	24.89 1.46	51.0 3.2	47.69 0.73	92.7 2.9	46.68 1.24	90.6 2.2
31.1	33.80 0.26	50.0 3.3	2.02 0.10	72.5 3.5	23.98 0.91	47.6 3.4	47.18 0.51	89.4 3.3	45.62 1.06	87.8 2.8
Feb. 10.0	33.79 0.01	46.6 3.4	2.22 0.20	68.9 3.6	23.64 0.34	43.9 3.7	46.91 0.27	85.9 3.5	44.77 0.85	84.7 3.1
	0.24	3.3	0.50	3.7	0.22	3.8	0.03	3.7	0.63	3.5
20.0	34.03	43.3	2.72	65.2	23.86	40.1	46.88	82.2	44.14	81.2
Mar. 2.0	34.50 0.47	40.2 3.1	3.51 0.79	61.6 3.6	24.65 0.79	36.3 3.8	47.08 0.20	78.4 3.8	43.76 0.38	77.5 3.7
12.0	35.18 0.68	37.5 2.7	4.56 1.05	58.2 3.4	25.98 1.33	32.6 3.7	47.52 0.44	74.7 3.7	43.63 0.13	73.7 3.8
21.9	36.06 0.88	35.1 2.4	5.85 1.29	55.0 3.2	27.80 1.82	29.0 3.6	48.19 0.67	71.0 3.7	43.75 0.12	69.8 3.9
31.9	37.09 1.03	33.3 1.8	7.36 1.51	52.0 3.0	30.08 2.28	25.6 3.4	49.07 0.88	67.5 3.5	44.12 1.44	65.9 3.9
	1.15	1.2	1.69	2.6	2.68	3.0	1.08	3.3	0.61	3.7
Apr. 10.9	38.24 1.23	32.1 0.7	9.05 1.84	49.4 2.2	32.76 3.03	22.6 2.7	50.15 1.25	64.2 3.0	44.73 0.85	62.2 3.6
20.9	39.47 1.26	31.4 0.0	10.89 1.95	47.2 1.8	35.79 3.32	19.9 2.7	51.40 1.40	61.2 2.6	45.58 1.07	58.6 3.3
30.8	40.73 1.25	31.4 0.6	12.84 2.03	45.4 1.3	39.11 3.55	17.6 1.8	52.80 1.52	58.6 2.1	46.65 1.26	55.3 3.0
May 10.8	41.98 1.20	32.0 1.2	14.87 2.06	44.1 0.8	42.66 3.70	15.8 1.3	54.32 1.61	56.5 1.7	47.91 1.44	52.3 2.6
20.8	43.18 1.11	33.2 1.8	16.93 2.05	43.3 0.3	46.36 3.76	14.5 0.8	55.94 1.67	54.8 1.2	49.35 1.57	49.7 2.1
30.7	44.29 0.99	35.0 2.3	18.98 2.00	43.0 0.2	50.12 3.74	13.7 0.2	57.61 1.69	53.6 0.7	50.92 1.68	47.6 1.7
June 9.7	45.28 0.84	37.3 2.7	20.98 1.84	43.2 0.7	53.86 3.63	13.5 0.3	59.30 1.67	52.9 0.2	52.60 1.74	45.9 1.1
19.7	46.12 0.66	40.0 3.0	22.87 1.74	43.9 1.3	57.49 3.44	13.8 0.8	60.97 1.61	52.7 0.4	54.34 1.76	44.8 0.5
29.7	46.78 0.47	43.0 3.3	24.61 1.55	45.2 1.7	60.93 3.15	14.6 1.3	62.58 1.51	53.1 1.0	56.10 1.74	44.3 0.0
July 9.6	47.25 0.27	46.3 3.4	26.16 1.32	46.9 2.1	64.08 2.78	15.9 1.8	64.09 1.36	54.1 1.4	57.84 1.66	44.3 0.6
19.6	47.52 0.06	49.7 3.6	27.48 1.04	49.0 2.4	66.86 2.33	17.7 2.2	65.45 1.18	55.5 1.9	59.50 1.54	44.9 1.1
29.6	47.58 0.15	53.3 3.6	28.52 0.74	51.4 2.7	69.19 1.81	19.9 2.6	66.63 0.96	57.4 2.2	61.04 1.37	46.0 1.6
Aug. 8.6	47.43 0.36	56.9 3.6	29.26 0.41	54.1 2.9	71.00 1.24	22.5 2.8	67.59 0.71	59.6 2.6	62.41 1.16	47.6 2.1
18.5	47.07 0.56	60.5 3.4	29.67 0.08	57.0 2.9	72.24 0.62	25.3 2.9	68.30 0.45	62.2 2.9	63.57 1.91	49.7 2.5
28.5	46.51 0.75	63.9 3.2	29.75 0.25	59.9 2.9	72.86 0.02	28.2 3.0	68.75 0.17	65.1 2.9	64.48 0.64	52.2 2.8
Sept. 7.5	45.76 0.91	67.1 3.0	29.50 0.58	62.8 2.8	72.84 0.66	31.2 3.0	68.92 0.12	68.0 3.0	65.12 0.34	55.0 2.9
17.4	44.85 1.06	70.1 2.6	28.92 0.89	65.6 2.5	72.18 1.28	34.2 2.8	68.80 0.40	71.0 2.9	65.46 0.03	57.9 3.0
27.4	43.79 1.19	72.7 2.2	28.03 1.15	68.1 2.2	70.90 1.85	37.0 2.5	68.40 0.66	73.9 2.6	65.49 0.28	60.9 3.0
Oct. 7.4	42.60 1.28	74.9 1.7	26.88 1.36	70.3 1.8	69.05 2.35	39.5 2.1	67.74 0.90	76.5 2.4	65.21 0.58	63.9 2.9
17.4	41.32 1.35	76.6 1.3	25.52 1.52	72.1 1.2	66.70 2.75	41.6 1.7	66.84 1.09	78.9 1.9	64.63 0.85	66.8 2.5
27.3	39.97 1.39	77.9 0.7	24.00 1.62	73.3 0.7	63.95 3.05	43.3 1.1	65.75 1.24	80.8 1.4	63.78 1.09	69.3 2.2
Nov. 6.3	38.58 1.38	78.6 0.1	22.38 1.65	74.0 0.0	60.90 3.22	44.4 0.5	64.51 1.34	82.2 0.9	62.69 1.28	71.5 1.7
16.3	37.20 1.35	78.7 0.4	20.73 1.61	74.0 0.6	57.68 3.27	44.9 0.2	63.17 1.38	83.1 0.4	61.41 1.43	73.2 1.2
26.3	35.85 1.28	78.3 1.1	19.12 1.50	73.4 1.2	54.41 3.19	44.7 0.8	61.78 1.37	83.3 0.4	59.98 1.52	74.4 0.5
Dec. 6.2	34.57 1.17	77.2 1.6	17.62 1.34	72.2 1.8	51.22 2.98	43.9 1.5	60.41 1.31	82.9 1.0	58.46 1.56	74.9 0.1
16.2	33.40 1.02	75.6 2.1	16.28 1.13	70.4 2.3	48.24 2.67	42.4 2.0	59.10 1.20	81.9 1.7	56.90 1.53	74.8 0.7
26.2	32.38 0.83	73.5 2.6	15.15 0.97	68.1 2.8	45.57 2.28	40.4 2.5	57.90 1.05	80.2 2.2	55.37 1.46	74.1 1.3
36.1	31.55	70.9	14.28	65.3	43.29	37.9	56.85	78.0	53.91	72.8

## ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

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The first part of this Ephemeris, embracing the positions of the Sun and Moon, the distances of the Moon from the center of the Sun, from the centers of the four most conspicuous planets, and from certain fixed stars, together with the ephemerides of the planets Mercury, Venus, Mars, Jupiter, and Saturn, is designed for the special use of navigators. The remainder of the work is intended to meet the wants of astronomers. It contains the ephemerides of Uranus and Neptune, the heliocentric co-ordinates of the seven major planets, the rectangular equatorial co-ordinates of the Sun, the Moon's longitude and latitude, data for the libration of the Moon, the obliquity of the ecliptic, the nutation, the positions of 383 standard stars, the ephemeris for the meridian of Washington, etc.

### TIME.

Astronomers make use of three different kinds of time, namely: First, true or apparent solar time; second, mean solar time; third, sidereal time.

*True or Apparent Solar Time.*—This species of time is called indiscriminately either true solar time or apparent solar time, and is measured by the motion of the true Sun; the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being always the hour angle of the Sun from the meridian. This is the most obvious and natural measure of time, but owing to the obliquity of the ecliptic and the varying motion of the Earth in its orbit, the intervals between successive returns of the Sun to the same meridian are not exactly equal, and consequently ordinary clocks and chronometers can not be regulated to true solar time.

*Mean Solar Time.*—To avoid the irregularity which would arise from using the true solar day, astronomers have recourse to a mean solar day, whose length is equal to the average of all the true solar days in a year. Just as the true solar day depends upon the motion of the true Sun, so the mean solar day is made to depend upon the motion of an imaginary mean Sun which moves along the equator at a perfectly uniform rate, and whose hour angle from any given meridian is always the mean solar time thereat. Ordinary clocks and watches and the chronometers used by navigators are regulated to this species of time.

*Equation of Time.*—The imaginary mean Sun is supposed to keep as near the true Sun as is consistent with perfect uniformity of motion, but it is sometimes before and sometimes behind the latter, the greatest difference amounting to rather more than one-quarter of an hour. The interval between the true Sun and the imaginary mean Sun is the equation of time, given on pages I and II of the Ephemeris for the meridian of Greenwich, and a knowledge of it is necessary for converting true solar time into mean solar time, or *vice versa*. As the mean Sun is an imaginary body, mean solar time can not be directly observed, but it can be got either from observations of the true Sun by applying to them the correction for the equation of time, or from observations of the stars by means of the sidereal time of mean noon, given on page II of the Ephemeris for the meridian of Greenwich.

*Sidereal Time.*—Sidereal time is measured, roughly speaking, by the daily motion of the stars; or in strict accuracy, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted. The point in question is the vernal equinox, and its hour angle is always the sidereal time. Astronomical clocks are usually regulated to sidereal time, and are then called sidereal clocks.

*Sidereal Day.*—A sidereal day is the interval between two successive transits of the vernal equinox over the same meridian. It is  $3^m 55^s.909$  of mean solar time shorter than the mean solar day, the tropical year of 365.2422 solar days being divided into 366.2422 sidereal days, each comprising 24 sidereal hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian. About March 23 of each year the sidereal clock agrees with the mean-time or ordinary clock, and the former gains on the latter  $3^m 56^s.555$  of sidereal time per day, so that at the end of a year it will have gained an entire day, and will again agree with the mean-time clock.

*Civil Day.*—According to the customs of society, the civil day commences at midnight, and comprises twenty-four hours, which extend to the next following midnight. The hours are counted from 0 to 12 in two series; the first, marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

*Astronomical Day.*—The astronomical day begins at noon on the civil day of the same date. It also comprises twenty-four hours, but they are reckoned from 0 to 24, and run from the noon of one day to that of the next following. Astronomical time as well as civil time may be either apparent or mean, according as it is reckoned from apparent noon or from mean noon.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day corresponds to the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14<sup>h</sup>, astronomical time; and January 9, 2 o'clock, P. M., civil time, is also January 9, 2<sup>h</sup>, astronomical time. Hence, we have the following rules:

*To convert Civil Time into Astronomical Time.*—If the civil time is marked A. M., take one from the day and add twelve to the hours, and the result will be the corresponding astronomical time; if the civil time is marked P. M., take away the designation P. M., and the astronomical time will result.

*To convert Astronomical Time into Civil Time.*—If the astronomical time is less than twelve hours, simply write P. M. after it. If greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the days. For example, October 3, 23 hours, astronomical time, is October 4, 11 o'clock, A. M., civil time.

*To find Greenwich Time.*—Express the longitude from Greenwich in time, and when west, add it to the local time, or when east, subtract it from the local time. The result will be the corresponding Greenwich time; mean or sidereal, according as the local time employed is mean or sidereal. For use with Part I of this Ephemeris, Greenwich mean time is ordinarily required.

## PART I—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2–217 give data arranged under the heads of the several months, and are therefore designated as the Calendar. Each month covers 18 pages, numbered from I to XVIII, whose contents are as follows:

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, and the *Equation of Time*. Adjoining columns contain the differences of these quantities for one hour. By multiplying any one of these differences by

the hours and parts of an hour from Greenwich apparent noon, and adding the product to, or subtracting it from, the corresponding quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of the quantity in question for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, but, when great accuracy is required, they should be interpolated for half the hours and parts of an hour of the Greenwich apparent time.

The *Equation of Time* given on page I is the mean time of apparent noon, or the hour angle of the mean Sun at that instant. The heading of the column directs how the equation is to be applied to apparent time, or the time given by an observation of the Sun, in order to get mean time. When in the course of the month there is a change from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change occurs.

The *Sun's Semidiameter* and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The semidiameter is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object, to the distance from the center of the Sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the Sun's center over the wires of a transit instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

This page is chiefly used when the Sun is observed on the meridian, at which instant the local apparent time is  $0^h 0^m 0^s$ . The longitude from Greenwich expressed in time is then the corresponding Greenwich apparent time, before or after noon according as the longitude is east or west. The longitude of any place is therefore the factor employed in reducing the quantities on this page to apparent noon at that place.

The right ascension of the Sun thus reduced is the sidereal time of local apparent noon, and the difference between that and the clock time of the meridian passage of the Sun is the error of the clock on sidereal time.

The declination of the Sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the Sun.

As an example of the use of page I:—

Let the Sun's declination be required at apparent noon, 1910, July 4, at a place whose longitude is  $89^\circ 40'$ , or  $5^h 58^m 40^s$  east from Greenwich:—

Local apparent time	July 4,	h	m	s
		0	0	0
Longitude from Greenwich (subtractive)			5	58 40
Greenwich apparent time	July 3,	18	1	20

Reducing the minutes and seconds to decimals of an hour, we find that this moment is  $18^h.022$  after Greenwich apparent noon on July 3, or  $5^h.978$  before Greenwich apparent noon on July 4.

On page 110 of the Ephemeris we find that the change of declination in one hour is:

July 3, at Greenwich apparent noon	—	11.44
July 4, at Greenwich apparent noon	—	12.45
Difference for one day	—	1.01

If great exactness is desired, we find the amount of this hourly difference for the time which is halfway between Greenwich noon and the time of observation; that is, for 9 hours after Greenwich noon of the 3d, this being half of 18 hours. Nine hours is 0.375 of a day; so the calculation is as follows:

Difference for one hour, July 3 . . . . .	— 11.44
Change for 0.375 of a day or $1''.01 \times 0.375$ . . . . .	— 0.38
Difference at 9 hours after noon . . . . .	— 11.82
$11''.82 \times 18.022 = 213''.0 = 3' 33''.0$	
Declination at Greenwich noon, July 3 . . . . .	N. 23 1 27.1
Change in 18.022 hours (subtractive) . . . . .	3 33.0
Sun's declination at time of observation . . . . .	N. 22 57 54.1

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given, the time is 5<sup>h</sup>.978 before Greenwich noon of July 4; half this interval is about 0.12 of a day, and the hourly motion for the middle of the interval is 12''.33. Then, we find—

Declination at Greenwich noon, July 4 . . . . .	N. 22 56 40.6
Product of $12''.33 \times 5.978 = 73''.7$ (additive) . . . . .	1 13.7
Sun's declination at time of observation . . . . .	N. 22 57 54.3

It will always be well to make the calculation in both ways, as a check; but if the results differ slightly, the one derived from the nearest noon should be regarded as the more accurate. At sea, however, it is ordinarily sufficient to compute the declination to the nearest half minute, and the reduction may then be found by Table 12 of BOWDITCH'S *American Practical Navigator*.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension and Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon*. The hourly changes of these quantities are also given, and may be used in reducing them for the longitude, or to any Greenwich mean time. When great precision is required, these changes should be interpolated for half the Greenwich time, as described in explaining the calculation of the declination.

The *Equation of Time* given on page II is the apparent time of mean noon, and is equivalent to the hour angle of the true Sun at the instant of mean noon. The heading of the column directs how the equation must be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, 9<sup>s</sup>.8565; or by Table III appended to this volume, for reducing intervals of mean solar to sidereal time; or by Table 9 of BOWDITCH'S *Navigator*.

The right ascensions and declinations on pages I and II are affected both by aberration and nutation, and therefore denote the *apparent* positions of the *true* Sun. Page I is used for observations which depend upon apparent time, as when the Sun is observed on the meridian; while page II is used when the times have been noted by a clock or chronometer regulated to mean time, as is the case in most observations of the Sun out of the meridian.

The Sun's declination is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth, and the equation of time is needed in finding the apparent time when determining the latitude from observations of the Sun out of the meridian.

The sidereal time of mean noon, or right ascension of the mean Sun, is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time, and this being added to the local astronomical mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given



sidereal time gives the interval of sidereal time from noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II appended to this volume, or from Table 8 of BOWDITCH's *Navigator*. Instead of using Table II, this reduction may be found by multiplying  $9^s.8296$  by the hours and parts of an hour of the sidereal interval from noon.

As examples of the use of page II:—

1.—Let the Sun's right ascension and the equation of time be required for 1910, July 13,  $9^h 2^m 30^s$ , A. M., mean time, at a place whose longitude is  $100^\circ 10'$ , or  $6^h 40^m 40^s$ , west of Greenwich.

Local astronomical mean time	July 12,	$\begin{array}{r} h \quad m \quad s \\ 21 \quad 2 \quad 30 \end{array}$
Longitude from Greenwich (additive)		$\begin{array}{r} 6 \quad 40 \quad 40 \\ \hline \end{array}$
Greenwich mean time	July 13,	$3 \quad 43 \quad 10 = 3^h.7194$

<i>Sun's Right Ascension.</i>		<i>Equation of Time.</i>	
July 13, Greenwich noon	$\begin{array}{r} h \quad m \quad s \\ 7 \quad 27 \quad 22.87 \end{array}$	July 13, Greenwich noon	$\begin{array}{r} m \quad s \\ 5 \quad 25.92 \text{ (subtractive)} \end{array}$
H. D. $10^s.167 \times 3.7194$	$\begin{array}{r} + \quad 37.81 \\ \hline 7 \quad 28 \quad 0.68 \end{array}$	H. D. $+ 0^s.310 \times 3.7194$	$\begin{array}{r} + \quad 1.15 \\ \hline 5 \quad 27.07 \end{array}$

In this case the hourly differences interpolated to half the interval, or  $1^h.86$  after noon, have been used. The equation of time is here subtractive from mean time. Its reduction could have been found by Table 12 of BOWDITCH's *Navigator*.

2.—If the sidereal time is required for the same date and time, we have—

July 13, sidereal time (at Greenwich mean noon)	$\begin{array}{r} h \quad m \quad s \\ 7 \quad 21 \quad 56.94 \end{array}$
Reduction for $3^h 43^m 10^s$ from Table III, or $9^s.8565 \times 3.7194$	$\begin{array}{r} + \quad 36.66 \\ \hline \end{array}$
Add the local astronomical mean time	$\begin{array}{r} 21 \quad 2 \quad 30.00 \\ \hline \end{array}$
The required sidereal time is (rejecting $24^h$ )	$\begin{array}{r} 4 \quad 25 \quad 3.60 \end{array}$

The reduction  $36.66$  could have been found in Table III corresponding to the Greenwich mean time  $3^h 43^m 10^s$ , or by Table 9 of BOWDITCH's *Navigator*.

3.—On 1910, July 13, A. M., at a place whose longitude is  $100^\circ 10' W.$ , suppose the sidereal time to be  $4^h 25^m 3^s.60$ , and that the corresponding mean time is required.

The astronomical day is July 12; the longitude in time,  $+ 6^h 40^m 40^s$ , or  $+ 6^h.678$ .

July 12, sidereal time (at Greenwich mean noon)	$\begin{array}{r} h \quad m \quad s \\ 7 \quad 18 \quad 0.38 \end{array}$
Reduction for $6^h 40^m 40^s$ from Table III, or $9^s.8565 \times 6.678$	$\begin{array}{r} + \quad 1 \quad 5 \quad 82 \\ \hline \end{array}$
The sidereal time of local mean noon	$\begin{array}{r} 7 \quad 19 \quad 6.20 \end{array}$
The given sidereal time ( $+ 24^h$ , if necessary for the following subtraction)	$\begin{array}{r} 28 \quad 25 \quad 3.60 \\ \hline \end{array}$
Subtracting the first from the second gives the sidereal interval from noon	$\begin{array}{r} 21 \quad 5 \quad 57.40 = 21^h.0993 \end{array}$
Reduction for $21^h 5^m 57^s.40$ from Table II, or $- 9^s.8296 \times 21.0993$	$\begin{array}{r} - \quad 3 \quad 27.40 \\ \hline \end{array}$
The required astronomical mean time is	July 12, $\begin{array}{r} 21 \quad 2 \quad 30.00 \end{array}$

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude* and *Latitude*, and the *Logarithm of the Radius Vector of the Earth*. The longitudes of the Sun are the true geometric longitudes, not corrected for aberration. They are given in two columns, headed respectively  $\lambda$  and  $\lambda'$ ;  $\lambda$  representing the Sun's longitude counted from the true equinox of the date; and  $\lambda'$ , the same co-ordinate counted from the mean equinox of the beginning of the Besselian fictitious year. The latitude is referred to the mean ecliptic of the date. Columns of hourly differences are given to facilitate finding the Sun's longitude, or the logarithm of the radius vector, for any hour from noon.

The last column on page III contains the *Mean Time of Sidereal Noon*; that is, the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich. It may be reduced to any meridian, or to any Greenwich sidereal time, by using the hourly difference,  $-9^s.8296$ , to effect the necessary interpola-

tion. The reduction, however, can be taken directly from Table II for reducing intervals of sidereal time to mean solar time, or from Table 8 of BOWDITCH'S *Navigator*.

This column may be used in converting sidereal time to mean time, instead of that on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the given sidereal time is less than 24 hours. Were it more than 24 hours, the mean time of sidereal noon should be taken out for July 11; that is, the preceding astronomical day.

	h	m	s
July 12, the mean time of Greenwich sidereal noon is . . . . .	16	39	15.46
Reduction for longitude from Table II, or $-9^{\circ}.8296 \times 6.678$ . . . . .	—	1	5.64
The mean time of local sidereal noon . . . . .	16	38	9.82
Add the given sidereal time . . . . .	4	25	3.60 = $4^{\text{h}}.4177$
The sum is . . . . .	21	3	13.42
Reduction for $4^{\text{h}} 25^{\text{m}} 3^{\text{s}}.60$ from Table II, or $-9^{\circ}.8296 \times 4.4177$ . . . . .	—	—	43.42
The required astronomical mean time . . . . .	July 12, 21	2	30.00

Page IV contains *The Moon's Semidiameter and Equatorial Horizontal Parallax*, for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of that quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the Sun's declination and the equation of time in the preceding examples. The sign plus or minus is prefixed to the hourly differences, according as the horizontal parallax is increasing or decreasing.

The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.273, or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for 1910, March 10, 7<sup>h</sup>, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of March 10 is 5''.0; then,

$$12^{\text{h}} : 7^{\text{h}} = 5''.0 : 2''.9,$$

which is the correction to be added to the semidiameter at noon, because the semidiameter is increasing. The Moon's semidiameter for March 10, 7<sup>h</sup>, is therefore 16' 25''.2.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon. When great precision is needed, the hourly differences should be interpolated for half the interval of Greenwich time from noon or midnight, and the horizontal parallax should be corrected for the latitude of the place of observation.

The *Mean Time of the Moon's Upper Transit at Greenwich* and the *Age of the Moon* are also contained on page IV. The time of transit is given to tenths of a minute, and is accompanied by a column of differences for one hour of longitude, by means of which the local time of the Moon's meridian transit may be computed for any other place whose longitude is known. Table 11 of BOWDITCH'S *Navigator* furnishes the necessary reduction by simple inspection. The age of the Moon, or the time elapsed since the preceding new Moon, is given to tenths of a day.

Pages V–XII contain *The Moon's Right Ascension and Declination* for each day and hour of Greenwich mean time. They are accompanied by columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may either be taken from a well-regulated chronometer, or may be obtained by applying the longitude, converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the given day and hour of Greenwich mean time; the *Diff. for 1 Minute* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added to or subtracted from the quantity, according as the latter is increasing or decreasing.

Thus, suppose the Moon's right ascension and declination are required for 1910, June 20, 10<sup>h</sup> 10<sup>m</sup> 30<sup>s</sup>, astronomical mean time at Greenwich:—

Right Ascension.			Declination.		
	h	m	s	°	'
June 20, 10 <sup>h</sup>	16	20	10.26	S. 22	17 39.6
Diff. 2.1029 × 10.5			22.08	+ 7.715 × 10.5	+ 1 21.0
June 20, 10 <sup>h</sup> 10 <sup>m</sup> 30 <sup>s</sup>	16	20	32.34	S. 22	19 0.6

For the sake of precision, the differences here employed have been interpolated for 5<sup>m</sup>.2 = 0<sup>h</sup>.09.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the Earth.

Pages XIII–XVIII contain the *Lunar Distances*, or the angular distances of the center of the Moon from the center of the Sun, from the centers of the four brighter planets, and from certain fixed stars, as they would appear to an observer at the center of the Earth. They are given for every third hour of Greenwich mean time, and as the reckoning begins at noon, the dates are astronomical. All the distances which can be observed on the same day are grouped together under that date, and the columns are read from left to right, across both pages of the same opening. The letter W. or E. is affixed to the name of the Sun, planet, or star, to indicate whether it is on the west or east side of the Moon.

An observer on the Earth's surface by measuring a lunar distance, correcting it for errors of his instrument and for the semidiameters of the objects, and clearing it from the effects of refraction and parallax, finds the true or geocentric distance; that is, the distance as it would have appeared from the center of the Earth at the moment of observation. By comparing this distance with the corresponding distances given in the *Ephemeris*, the Greenwich mean time of the observation can be derived.

To lessen the labor of computation, the *Ephemeris* contains, between every two successive distances, the logarithm of the seconds of time in which the distance changes one second of arc; or, as it is usually called, the *Proportional Logarithm of the Difference*. It is given for the middle instant of the two hours between which it is placed.

For computing the Greenwich time corresponding to a given lunar distance we have the following rule:

*Find in the Ephemeris the two distances between which the true distance falls; take out the nearer of these, the hours of Greenwich time over it, and the P. L. of Diff. between them.*

*Find the difference between the true distance and the distance taken from the Ephemeris; and from the proportional logarithm of this difference, as found in Table 45 of BOWDITCH'S Navigator, subtract the P. L. of Diff. taken from the Ephemeris.*

*The result will be the proportional logarithm of an interval of time to be added to the hours of Greenwich time, taken from the Ephemeris, when the earlier Ephemeris distance is used; or to be subtracted from the hours of Greenwich time, when the later Ephemeris distance is used.*

Another method is to add the common logarithm of the difference in seconds between the true and the *Ephemeris* distances to the P. L. of Diff. of the *Ephemeris*; and then the sum will be the common logarithm of the correction to be applied to the hours of Greenwich time. Table 34 of BOWDITCH'S *Navigator* saves the operation of reducing degrees (or hours) and minutes to seconds, and the reverse.

As the P. L. of Diff. in the *Ephemeris* varies continually, the Greenwich time found by the methods just described may not be sufficiently exact. To correct it for such variation, or second difference, take the difference between the P. L. of Diff. used and the one which follows it in the *Ephemeris* (or, more strictly, half the difference of the preceding and following ones). With this difference, and the first correction of the Greenwich time already found, enter Table I, appended to this volume, and take out the corresponding seconds, which are to be added to the approximate Greenwich time when the Prop. Logs. in the *Ephemeris* are decreasing, or subtracted when they are increasing.

Thus the Greenwich mean time of an observation can be ascertained, and if the observer has noted the time of observation by a chronometer, the difference between this chronometer time and the Greenwich mean time will be the error of the chronometer on Greenwich time as found from the lunar distance. In that way lunar distances can be used as a check upon the chronometer, and by a series of them carefully observed on both sides of the Moon, the chronometer error may generally be determined within 20 or 30 seconds.

If the observer has found the local mean time of observation from the observed altitude of one of the bodies, or by a watch regulated to that time by recent observations and corrected for change of longitude in the interval, the difference of this local time and the Greenwich time found from the lunar distance will be his longitude. A longitude derived by this method should always be considered as uncertain by 5' or more.

As an example of finding the Greenwich mean time from a lunar distance, suppose that in 1910, January 8, the corrected distance of the Moon's center from Regulus is  $111^{\circ} 20' 0''$ —

Corrected distance	111 20 0	
Distance in Ephemeris Jan. 8 XV hours	110 56 18	P. L. 0.2771
Difference	23 42	P. L. 0.8805
		P. L. 0.6034
	h m s	
Time from XV hours ( <i>after</i> )	0 44 52	
Corr. for 2d Diff., Table I	+ 3	
Greenwich mean time Jan. 8	15 44 55	

By a table of common logarithms, or a table of logarithms of small arcs, the reduction of the Greenwich time would be found thus:

From Ephemeris,	P. L. 0.2771
Diff. of distances, $23^{\circ} 42' = 1422''$	log 3.1529
Red. of Greenwich time, $2692'' = 0^h 44^m 52^s$	log 3.4300

The result is the same as by the previous method.

Pages 218–249 contain the geocentric ephemerides of the seven major planets. The places given are apparent positions; that is, they are referred to the equator and true equinox of the date, and are corrected for aberration. All the data except meridian passage are given for the instant of Greenwich mean noon. The column *Meridian Passage* shows the hour, minute, and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that given for the Sun on pages 557–560. The local mean time of meridian passage of any planet, at any place, can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich passage.

Pages 250–271 contain the heliocentric co-ordinates of the seven major planets, and the logarithms of their distances from the Earth. The heliocentric longitude is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The daily motion is given for the instant of Greenwich mean noon. The column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitude in order to obtain the longitude counted along the orbit of the planet. The latter is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The heliocentric latitude is counted from the mean ecliptic of the date.

The *Logarithm of Radius Vector* is the logarithm of the distance of the center of the planet from that of the Sun, at the Greenwich mean noon whose date is given in the first column. The last two columns give, respectively, the logarithm of the true distance of the center of the planet from that of the Earth, for the Greenwich noon indicated on the left-hand side of the page, and for the time which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean midnight of the same day; in the case of Venus and Mars, it is the mean noon of the day immediately following; in the case of Jupiter and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 272–279 contain the rectangular co-ordinates of the center of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox of each date as the plane and point of reference. Each co-ordinate is given both for Greenwich mean noon and for Greenwich mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan. 0* give the corrections to be applied to the co-ordinates for noon in order to obtain the corresponding co-ordinates referred to the mean equator and the mean equinox of the beginning of the Besselian fictitious year.

Pages 280–283 give for every Greenwich mean noon and midnight the apparent geocentric longitude and latitude of the Moon referred to the true ecliptic and equinox of the date.

Page 284 contains the position of the Moon's equator, the longitude of the Moon's perigee, the mean longitude of the Moon's ascending node, and the Moon's mean longitude.

Page 285 contains the elements of the libration of the Moon, and the Sun's aberration and horizontal parallax. The epochs of greatest libration of the Moon, together with the formulæ for finding the libration in longitude and latitude, are given on page 439. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the Sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. *The Sun's Equatorial Horizontal Parallax*, given in the last column, is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

Pages 286–288 give data for precession and the obliquity of the ecliptic, together with all sensible terms arising from the motions of the equator and ecliptic. To show clearly the relations of these quantities, let

$\lambda$  = the longitude of any body referred to the true equinox of the date.

$\lambda'$  = the longitude of the same body referred to the mean equinox of the beginning of the Besselian fictitious year.

$\psi_1$  = the adopted value of the general precession.

$\delta'\psi$  = the principal term of the nutation in longitude; or, in other words, the correction to be applied to the longitude of a body referred to the mean equinox of date, in order to obtain that longitude as referred to the true equinox, exclusive of short period terms. When the correction is positive, the longitudes referred to the true equinox are greater than those referred to the mean equinox; while the contrary is the case when the correction has a negative sign.

$\delta''\psi$  = the short period terms of nutation in longitude, given on pages 287–288.

$\omega$  = the true or apparent obliquity of the ecliptic at the date.

$\omega'$  = the mean obliquity of the ecliptic at the beginning of the Besselian fictitious year.

$\delta\omega$  = the principal term of the nutation of the obliquity of the ecliptic; or, in other words, the correction to be applied to the mean obliquity of date in order to find the true or apparent obliquity, exclusive of short period terms. This quantity is tabulated on page 286, and is positive or negative according as the true obliquity is greater or less than the mean obliquity.

$\delta''\omega$  = the short period terms of nutation in obliquity, given on pages 287–288.

$\tau$  = the fraction of a year intervening between the instant when the Sun's mean longitude was  $280^\circ$  and the date for which  $\lambda$  or  $\omega$  is required.

Then

$$\begin{aligned}\lambda &= \lambda' + \tau \psi_1 + \delta'\psi + \delta''\psi \\ \omega &= \omega' - 0''.464\tau + \delta'\omega + \delta''\omega\end{aligned}$$

Page 286 contains, for each fifth Greenwich mean noon throughout the year, certain quantities which may be described in terms of the above notation as follows: The *Precession in Longitude from 1910.0* =  $\tau \psi_1$ ; the *Nutation in Longitude* =  $\delta'\psi$ ; the *Nutation in Right Ascension* =  $(\delta'\psi) \cos \omega'$ ; the *Nutation in Obliquity* =  $\delta'\omega$ , and the *Obliquity of the Ecliptic* =  $\omega - \delta''\omega$ , which is the true inclination of the Earth's equator to the ecliptic, exclusive of the terms depending on the Moon's longitude.

Pages 287–288 contain the values of  $\delta''\psi$  and  $\delta''\omega$ , which are not included in the values of nutation given on page 286.

## PART II—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Page 290 contains formulæ for reducing the positions of fixed stars, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of STRUVE and PETERS, and expressed in the notation of BESSEL.

Pages 291–294 contain the logarithms of the *Besselian Star-Numbers*,  $A$ ,  $B$ ,  $C$ ,  $D$ , for each Washington mean midnight, with the values of  $E$  appended at the bottoms of the pages. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given, and in ordinary cases four-figure logarithms suffice; but where extreme accuracy is desired the logarithms of  $A$ ,  $C$ , and  $D$  are sometimes needed to five places of decimals. If used in accordance with the English and French notation, the pair of quantities  $A$  and  $B$  must be interchanged with the pair  $C$  and  $D$ ; that is,  $A$  must be interchanged with  $C$ , and  $B$  with  $D$ . Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:—

*Computation of the apparent place of 26 Sagittarii for July 1, 1910, for the upper transit at Washington.*

$\log a$	0.5632	$\log b$	7.6696 <i>n</i>	$\log c$	8.0617	$\log d$	8.8574 <i>n</i>
$\log A$	9.3457	$\log B$	0.6706 <i>n</i>	$\log C$	0.4877	$\log D$	1.3047 <i>n</i>
$\log a'$	0.5008	$\log b'$	9.9945	$\log c'$	7.5785 <i>n</i>	$\log d'$	8.8067 <i>n</i>
$\log Aa$	9.9089	$\log Bb$	8.3402	$\log Cc$	8.5494	$\log Dd$	0.1621
$\log Aa'$	9.8465	$\log Bb'$	0.6651 <i>n</i>	$\log Cc'$	8.0662 <i>n</i>	$\log Dd'$	0.1114
<i>Mean Place, 1910.0,</i>		$a_0$	$\begin{matrix} h & m & s \\ 18 & 36 & 22.298 \end{matrix}$	$\delta_0$			
		$Aa$	+ 0.811	$Aa'$			
		$Bb$	+ 0.022	$Bb'$			
		$Cc$	+ 0.035	$Cc'$			
		$Dd$	+ 1.452	$Dd'$			
		$E$	— 0.002	$\tau\mu'$			
		$\tau\mu$	+ 0.001				
<i>Apparent Place, July 1,</i>		$a$	$\begin{matrix} h & m & s \\ 18 & 36 & 24.617 \end{matrix}$	$\delta$			
				= — 23 55 6.91			

Pages 295–302 contain the *Independent Star-Numbers*, which can frequently be advantageously used instead of the *Besselian Star-Numbers*. These quantities are connected with those of BESSEL by the relations given on page 290, which also contains the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants,  $a$ ,  $b$ ,  $c$ ,  $d$ ,  $a'$ ,  $b'$ ,  $c'$ ,  $d'$ , while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four-figure logarithms usually suffice, but

where extreme accuracy is desired the logarithms of  $g$  and  $h$  are needed to five places of decimals, and  $G$  and  $H$  are needed to one-tenth of a minute of arc. The column  $\tau$  gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:—

*Computation of the apparent place of 26 Sagittarii for July 1, 1910, for the upper transit at Washington.*

$G = \begin{matrix} & h & m \\ 20 & 54.0 \end{matrix}$		$\delta_0 = - \begin{matrix} & & s \\ 23 & 55.1 \end{matrix}$	
$a_0 = 18 \ 36.4$		$G + a_0 = 15 \ 30.4$	
$H = 11 \ 25.3$		$H + a_0 = 6 \ 1.7$	
$\log \frac{1}{r}$	8.8239	$\log \frac{1}{r}$	8.8239
$\log g$	0.8101	$\log h$	1.3097
$\sin (G + a_0)$	9.9000 $n$	$\sin (H + a_0)$	0.0000
$\tan \delta_0$	9.6469 $n$	$\sec \delta_0$	0.0390
$\log (g)$	9.1809	$\log (h)$	0.1726
		$a_0 = \begin{matrix} & h & m & s \\ 18 & 36 & 22.298 \end{matrix}$	
		$f = + 0.679$	
		$(g) = + 0.152$	
		$(h) = + 1.488$	
		$\tau \mu = + 0.001$	
		$a = \begin{matrix} & h & m & s \\ 18 & 36 & 24.618 \end{matrix}$	
$\log g$	0.8101	$\log h$	1.3097
$\cos (G + a_0)$	9.7835 $n$	$\cos (H + a_0)$	7.8703 $n$
$\log (g')$	0.5936 $n$	$\sin \delta_0$	9.6079 $n$
		$\log (h')$	8.7879
		$\delta_0 = - \begin{matrix} & & s \\ 23 & 55 & 4.26 \end{matrix}$	
		$(g') = - 3.92$	
		$(h') = + 0.06$	
		$(i) = + 1.22$	
		$\tau \mu' = - 0.01$	
		$\delta = - \begin{matrix} & & s \\ 23 & 55 & 6.91 \end{matrix}$	
$\log i$	0.1250		
$\cos \delta_0$	9.9610		
$\log (i)$	0.0860		

Page 303 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short period terms. They are useful in computing ephemerides of stars, similar to those on pages 324–399, for which constants containing short period terms should not be employed.

Pages 304–311 contain the mean places of three hundred and eighty-three stars, for the beginning of the Besselian fictitious year 1910, or, in other words, for the moment when the Sun's mean longitude is  $280^\circ$ . The annual variations are to be considered as the differential coefficients of each co-ordinate with respect to the time at the beginning of the year.

Pages 312–323 contain the apparent positions of the five circumpolar stars,  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$  and  $\lambda$  Ursæ Minoris, and  $\gamma$  Cephei, for every upper transit at Washington. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 312, we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit following that of July 1 (page 318) does not take place until July 2.3. Hence, the lower transit of July 1 precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Mean Solar Date*.

Pages 324–399 contain, for every tenth upper transit at Washington, the apparent places of 378 stars, being all those given in the list of mean places, except the five circumpolars. The mean solar date in the left-hand column of each page gives the day and tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each co-ordinate are given for every ten days.

Pages 400–407 contain the apparent right ascension and declination of the Sun, both for Washington mean and apparent noon, and the hourly motion of the Sun in these co-ordinates; the equation of time, the semidiameter of the Sun, and the sidereal time of semidiameter passing the meridian, for Washington apparent noon; and, lastly, the sidereal

time of mean noon. The hours and minutes of right ascension and the degrees and minutes of declination are always made the same for both mean and apparent noon. In cases where they really differ, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that the sum of the two remains correct. The hourly motions in right ascension and declination are given for the columns headed *Mean Noon*, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich*.

Pages 408-415 contain the right ascension, declination, semidiameter, and parallax of the Moon, at the moment of transit over the meridian of Washington. The mean time given in the second column is that of transit of the Moon's center over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington would exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the Moon in right ascension were uniform, or, in other words, they are differential coefficients corresponding to the instants of Washington transit. By means of them, when second differences are taken into account, the position of the Moon can be computed with great exactness for the moment of transit over any meridian not more than one hour distant from Washington. To obtain the same accuracy for more distant meridians, we may proceed as follows: Let  $F$  represent either the *Mean Time of Transit*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let  $D$  represent the corresponding *Difference for One Hour of Longitude*. Write down three successive values of  $F$ , together with the corresponding values of  $D$ , and difference the latter as in the following scheme; where the middle values,  $F_0$  and  $D_0$ , belong to the Washington culmination from which is to be derived the value of  $F$  for the culmination on the meridian whose longitude is  $\lambda$  :—

Function.	Diff. for 1 Hour of Longitude.	$\Delta'$	$\Delta''$
$F_{-1}$	$D_{-1}$	$a'$	
$F_0$	$D_0$	$a''$	$b$
$F_{+1}$	$D_{+1}$		

Then, for the culmination at the meridian  $\lambda$

$$F_\lambda = F_0 + \lambda D_0 + \frac{\lambda^2}{96}(a' + a'') + \frac{\lambda^3 b}{3456}$$

where  $\lambda$  must be expressed in hours and decimals of an hour, and is to be taken plus or minus according as the longitude from Washington is west or east.

The columns of *Sidereal Time of Semidiameter passing Meridian*, *Geocentric Semidiameter* and *Equatorial Horizontal Parallax* do not seem to need any explanation, except that they all refer to the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within  $1''$  of the opposite limb, both can be well observed, and in such cases both are indicated.

Pages 416-431 contain the geocentric apparent right ascensions and declinations of



six major planets, together with their horizontal parallaxes, semidiameters, and sidereal times of semidiameters passing the meridian, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The columns following the dates give the Washington mean times of these transits.

### PART III—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Washington mean time, except in the case of the eclipses, which are expressed in Greenwich mean time.

Pages 434-438 contain all necessary data respecting the solar and lunar eclipses which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51 : 50. The principal circumstances of each total and annular solar eclipse are stated on five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, and the latitude and longitude of the point of contact follow.

The line entitled "Central eclipse at noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane. The latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface follow, and there the eclipse will be central and the Sun will be exactly on the meridian.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, respectively, the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

*Maps of the Eclipses.*—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for the changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of 1910, May 8, begins and ends at the place whose latitude is  $30^\circ$  S. and whose longitude is  $118^\circ$  E.

For the beginning we compare the distance of the place from the curves of  $16^h$  and  $17^h$ , and find it to correspond to about 40 minutes from the former, thus giving for the approximate time of beginning  $16^h 40^m$ ; for the end we compare the distance of the place from the curves of  $19^h$  and  $20^h$ , and find it to be about 10 minutes from the former, thus giving for the approximate time of ending  $19^h 10^m$ , and both of these results are probably correct to within 3 or 4 minutes. Changing to local mean time, we shall have—

	Beginning.			Ending.		
	d	h	m	d	h	m
Greenwich mean time . . . . .	May	8	16 40	8	19 10	
Longitude east . . . . .			7 52		7 52	
Local mean time . . . . .	May	9	0 32	9	3 2	

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relatively to the central line and to the limit. On the central line, the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit; the measurements being made upon a line drawn through the place, perpendicularly to the central line.

*More Accurate Computations.*—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of  $xy$ . We take the intersection of this plane with that of the Earth's equator as the axis of  $x$ , and the center of the Earth as the origin of co-ordinates. The axis of  $y$  is perpendicular to that of  $x$ , and directed toward the north;  $x$  and  $y$  are then the co-ordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle  $d$ , of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle  $\mu$  is the Greenwich hour angle of this same point of the celestial sphere.

The quantities  $l_1$  and  $l_2$  are the radii of the shadow cones upon the fundamental plane,  $l_1$  corresponding to the penumbra, and  $l_2$  to the umbra, or annulus. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which  $l_2$  is regarded as positive for an annular, and negative for a total eclipse.

The angles  $f_1$  and  $f_2$ , the tangents of which are given, are the angles which the elements of the respective shadow cones make with the axis of the shadow; or, they are the semi-angles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of  $x'$ ,  $y'$ , and  $\mu'$ , which are the changes of  $x$ ,  $y$ , and  $\mu$ , in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that at the moments of beginning and ending the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find this distance and radius we proceed as follows:—

(1) The co-ordinates of the observer,  $\xi$ ,  $\eta$ , and  $\zeta$ , together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The co-ordinates  $x$  and  $y$  of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find  $\rho \cos \varphi'$  and  $\rho \sin \varphi'$ , which are the geocentric co-ordinates of the station referred to the Earth's equator,  $\rho$  being the distance from the center of the Earth, and  $\varphi'$  the geocentric latitude. These co-ordinates may be obtained from geodetic tables, or may be computed from the following table based on CLARKE'S spheroid of 1866, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

$\varphi$  being, as usual, the geographic latitude.

*Table for Computing the Geocentric Co-ordinates of a Place.*

$\varphi$	Log F.	Log G.
0°	0.00000	0.00295
5	0.00001	0.00294
10	0.00004	0.00291
15	0.00010	0.00285
20	0.00017	0.00278
25	0.00026	0.00269
30	0.00037	0.00258
35	0.00048	0.00247
40	0.00061	0.00234
45	0.00074	0.00221
50	0.00086	0.00209
55	0.00099	0.00196
60	0.00111	0.00184
65	0.00121	0.00174
70	0.00130	0.00165
75	0.00138	0.00157
80	0.00143	0.00152
85	0.00146	0.00149
90	0.00147	0.00147

For the assumed Greenwich mean time of computation, take from the table of elements the values of  $\sin d$ ,  $\cos d$ , and  $\mu$ . Then, with  $\lambda$  for the longitude west from Greenwich, the co-ordinates of the observer will be—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$

$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2$$

$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2$$

and their variations in one minute of mean time will be—

$$\xi' = [7.63992] \rho \cos \varphi' \cos (\mu - \lambda)$$

$$\eta' = [7.63992] \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992] \xi \sin d$$

$\zeta'$  is not needed.

(2) For the same assumed moment of Greenwich mean time, take from the tables of elements the co-ordinates  $x$  and  $y$  of the axis of the shadow, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by  $x'$  and  $y'$ , and their logarithms are given beneath the tables of  $x$  and  $y$ .

(3) The distance  $m$  and position-angle  $M$  of the axis of the shadow relatively to the observer, and the relative motions,  $n$  and  $N$ , are computed by the formulæ—

$$m \sin M = x - \xi$$

$$m \cos M = y - \eta$$

$$n \sin N = x' - \xi'$$

$$n \cos N = y' - \eta'$$

(4) Both for the shadow and for the penumbra, the radius  $L$  at the distance  $\zeta$  from the fundamental plane is computed by the formula—

$$L = l - \zeta \tan f$$

$l$  and  $f$  being found from the table of elements, and  $\zeta$  computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have—

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction  $\tau$  to the assumed time is computed thus: Find the angle  $\psi$  from the equation,

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values for this angle, of which one will be in the first and the other in the second quadrant when  $\sin \psi$  is positive, and one in the third and the other in the fourth quadrant when  $\sin \psi$  is negative; but simplicity will be gained by taking only that value of  $\psi$  for which  $\cos \psi$  is positive. This value lies between the limits  $+90^\circ$  and  $-90^\circ$ . The correction  $\tau$  to the assumed time of beginning or ending of the eclipse will then be found, in minutes, from—

$$\tau = - \frac{m \cos (M - N)}{n} \mp \frac{L \cos \psi}{n}$$

where the double sign is to be taken negative for the beginning and positive for the ending.

However, one such pair of values of  $\tau$  can not give the times of both beginning and ending with accuracy. To attain that, we must commence the computation by assuming two times, one near the beginning, and the other near the ending of the eclipse; both of which may be derived from the chart with sufficient exactness. The computation for the first assumed time will give a small value of  $\tau$  which, when applied to the assumed time, will give the beginning of the eclipse nearly correctly, and a large value which will give an inaccurate time of ending. Similarly the computation for the second assumed time will give a small and nearly correct value of  $\tau$ , for finding the time of ending, and a large and inaccurate negative value for finding the time of beginning. We shall thus deduce two times of each phase, only one of which is to be regarded as approximately correct.

The more accurate times of beginning and ending may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a pair of values of  $\tau$ , which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors, but a second approximation may be obtained without it, by finding a corrected value of  $\tau$  in accordance with the formulæ—

$$\delta\tau = \mp \frac{\tau(l' + [5.3100] \xi \cos d)}{n \cos \psi} - \frac{[4.9788] \tau^2}{n \cos \psi} [\xi \sin (N \mp \psi) - \eta_1 \cos (N \mp \psi)]$$

$$\tau_0 = \tau + \delta\tau$$

where the double signs are to be taken negative for the beginning of the eclipse and positive for the ending.  $l'$  is the variation of  $l$  for one minute of time, and its numerical value can be taken by inspection from the table of Besselian elements.

If the resulting values of  $\tau_0$  are not greater than fifteen minutes, the corrected times of contact thus obtained will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction. To guard against numerical mistakes it is better, after making this final correction, to repeat the computations so far as to obtain new values of  $m$  and  $L$  for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, the computer must use his own judgment as to making further corrections and computations.

*Position-angle of Point of Contact.*—The position-angle  $P$ , of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formula—

$$P = N - \psi \pm 180^\circ \text{ for the beginning,}$$

$$P = N + \psi \quad \text{for the ending,}$$

it being assumed that, in each case, the value of  $\psi$  is taken between the limits  $\pm 90^\circ$ .

*Computation of the Solar Eclipse of 1910, May 8, for the point on the surface of the earth whose position is—*

$$\begin{array}{lcl} \text{Latitude, } \varphi = & -30 & 0 \quad 0 \\ \text{Longitude, } \lambda = & -118 & 0 \quad 0 \end{array}$$

The geocentric coordinates of this point are—

$$\begin{array}{l} \rho \sin \varphi' = 9.69639 n \\ \rho \cos \varphi' = 9.93790 \end{array}$$

From the Eclipse Chart we find the approximate times of the phases to be—

	d	h	m		Beginning.	Ending.
					16 <sup>h</sup> 40 <sup>m</sup>	19 <sup>h</sup> 10 <sup>m</sup>
Beginning May	8	16	40	} Greenwich Mean Time.		
Ending	8	19	10			
Greenwich Mean Time, $T$ ,	May 8					
	$\mu$				250 54 30	288 24 48
	$\lambda$				— 118 0 0	— 118 0 0
	$\mu - \lambda$				8 54 30	46 24 48
	$\rho \cos \varphi'$				9.93790	9.93790
	$\sin (\mu - \lambda)$				9.18992	9.85994
	$\log \xi$				9.12782	9.79784
	$\xi$				+ 0.13422	+ 0.62783
	$\rho \sin \varphi'$				9.69639 $n$	9.69639 $n$
	$\cos d$				9.98033	9.98027
	$\log \eta_1$				9.67672 $n$	9.67666 $n$
	$\eta_1$				— 0.47503	— 0.47497

	Beginning.	Ending.
$\rho \cos \varphi'$	9.93790	9.93790
$\sin d$	9.46877	9.46943
$\cos (\mu - \lambda)$	9.99473	9.83851
$\log \eta_*$	9.40140	9.24584
$\eta_*$	+ 0.25200	+ 0.17613
$\eta = \eta_1 - \eta_*$	- 0.72703	- 0.65110
$\rho \sin \varphi' \sin d$	9.16516 <i>n</i>	9.16582 <i>n</i>
$\zeta_1$	- 0.14627	- 0.14649
$\rho \cos \varphi' \cos d \cos (\mu - \lambda)$	9.91296	9.75668
$\zeta_*$	+ 0.81838	+ 0.57106
$\zeta = \zeta_1 + \zeta_*$	+ 0.67211	+ 0.42457
const. log	7.63992	7.63992
$\rho \cos \varphi' \cos (\mu - \lambda)$	9.93263	9.77641
$\log \xi'$	7.57255	7.41633
$\xi'$	+ 0.003737	+ 0.002608
const. log	7.63992	7.63992
$\xi \sin d$	8.59659	9.26727
$\log \eta'$	6.23651	6.90719
$\eta'$	+ 0.000172	+ 0.000808
$x - \xi$	- 0.34512	+ 0.51476
$y - \eta$	- 0.37424	+ 0.09136
$x' - \xi'$	+ 0.005285	+ 0.006416
$y' - \eta'$	+ 0.003441	+ 0.002800
$m \sin M$	9.53797 <i>n</i>	9.71160
$m \cos M$	9.57315 <i>n</i>	8.96076
$\tan M$	9.96482	0.75084
$M$	222° 40' 55"	79° 56' 8"
$\cos M$	9.86636 <i>n</i>	9.24243
$\log m$	9.70679	9.71833
$n \sin N$	7.72304	7.80726
$n \cos N$	7.53668	7.44716
$\tan N$	0.18636	0.36010
$N$	56° 55' 56'	66° 25' 22"
$\sin N$	9.92325	9.96214
$\log n$	7.79979	7.84512
$\tan f$	7.66558	7.66558
$\log \zeta$	9.82744	9.62795
	7.49302	7.29353
$\zeta \tan f$	+ 0.00311	+ 0.00197
$l$	+ 0.53189	+ 0.53193
$L$	+ 0.52878	+ 0.52996
$M - N$	165° 44' 59"	13° 30' 46"
$\sin (M - N)$	9.39122	9.36859
$\log m$	9.70679	9.71833
colog $L$	0.27673	0.27576
$\sin \psi$	9.37474	9.36268

	Beginning. 13° 42' 33"	Ending. 13° 19' 36"
$\psi$		
$\log \frac{m}{n}$	1.90700	1.87321
$\cos (M - N)$	9.98643 <i>n</i>	9.98781
	1.89343 <i>n</i>	1.86102
$-\frac{m}{n} \cos (M - N)$	+ 78.240	- 72.613
$\log L$	9.72327	9.72424
$\cos \psi$	9.98744	9.98814
$\text{colog } n$	2.20021	2.15488
	1.91092	1.86726
$\mp \frac{L \cos \psi}{n}$	- 81.456	+ 73.665
	<sup>m</sup>	<sup>m</sup>
$\tau$	- 3.216	+ 1.052
	<sup>h</sup> <sup>m</sup>	<sup>h</sup> <sup>m</sup>
$T + \tau$	16 36.784	19 11.052

Since the value of  $\tau$  for the beginning is rather large, we compute the correction  $\delta\tau$  for this phase as follows:

	Beginning.		Beginning.
const. log	5.3100	$\cos (N - \psi)$	9.8626
$\log \xi$	9.1278	$\log \eta_2$	9.4014
$\cos d$	9.9803		
	4.4181	$\log \eta_2 \cos (N - \psi)$	9.2640
number +	0.0000026	$\xi \sin (N - \psi)$	+ 0.0919
$l' +$	0.0000010	$\eta_2 \cos (N - \psi)$	+ 0.1837
sum +	0.0000035	diff.	- 0.0918
$\log (\text{sum})$	4.5563	$\log (\text{diff.})$	8.9628 <i>n</i>
$\log \tau$	0.5073 <i>n</i>	const. log	4.9788 <i>n</i>
$\text{colog } n$	2.2002	$\log \tau^2$	1.0146
$\sec \psi$	0.0126	$\text{colog } n \cos \psi$	2.2128
	7.2764 <i>n</i>		7.1690
(1)	- 0.0019	(2)	+ 0.0015
$N - \psi$	43° 13'		<sup>m</sup>
$\sin (N - \psi)$	9.8355	$-(1) + (2) = \delta\tau$	+ 0.003
$\log \xi$	9.1278	$\tau$	- 3.216
$\log \xi \sin (N - \psi)$	8.9633	$\tau_0$	- 3.213

The corrected time of beginning is, therefore,

$$T_0 = \text{May } 8^{\text{d}} 16^{\text{h}} 36^{\text{m}}.787,$$

Whence we find—

	Beginning. d h m	Ending. d h m
Greenwich Mean Time.	May 8 16 36.787	8 19 11.052
$\lambda$	- 7 52.000	- 7 52.000
Local Mean Time,	May 9 0 28.787	9 3 3.052

Therefore we have—

Beginning of the Eclipse,	May 9 0 28 47.2	} Local Mean Time.
End of the Eclipse,	May 9 3 3 3.1	

	Beginning.	Ending.
$N \mp \phi$	43 13.4	79 45.0
constant	+180 0.0	0 0.0
Angle of position: $P$	223 13.4	79 45.0

from the north point of the Sun's disk toward the east for direct image.

*Moon's Phases, Libration, etc.*—Page 439 gives the Washington mean times of the Moon's phases, apogee, perigee, and greatest libration, together with the formulæ for finding the libration in longitude and latitude whenever required.

*Mean Places of Stars Occulted During the Year.*—Pages 440–443 contain, for the year 1910, the adopted mean places and annual proper motions of such stars as will be occulted by the Moon, but are not included in the list given on pages 304–311. These additional stars are necessary in order to provide each month a sufficient number brighter than the 6.55 magnitude which will be occulted at a distance of more than  $25^\circ$  from the Sun.

*Elements of Occultations.*—Pages 444–477 give the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of co-ordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from 1910.0* give the quantities necessary to reduce the mean place of the star at the beginning of 1910 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:—

The *Washington Mean Time* is the moment,  $T$ , at which the two bodies are in geocentric conjunction in right ascension. At that moment the co-ordinate  $x$  of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle, H*, gives the common geocentric hour angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Washington—positive toward the west and negative toward the east. Column  $Y$  gives the co-ordinate  $y$  of the axis of the cylinder upon the fundamental plane at the same moment. Columns  $x'$  and  $y'$  give the variations of  $x$  and  $y$  in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star relatively to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

*Prediction of Occultations for a Given Place.*—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.
2. The quantity  $H - \lambda$ , taken without regard to sign, must be less than the semi-diurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.



3. The Sun must not be much more than an hour above the horizon at the local mean time  $T - \lambda$ , unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of  $-\lambda$  on the bottom of a slip of paper, and in passing through the list of occultations, to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether  $H - \lambda$  or  $T - \lambda$  falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

$T$  = the instant of geocentric conjunction of Moon and star in right ascension, expressed in Washington mean solar time;

$H$  = the Washington west hour angle of the two bodies at that moment;

$\lambda$  = the longitude west of Washington;

$h_0 = H - \lambda$  = the local hour angle of the star at the instant  $T$ ;

$\delta$  = the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric co-ordinates of the place,  $\rho \sin \varphi'$  and  $\rho \cos \varphi'$ , are to be computed by the formulæ and table given in connection with eclipses on page 569.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocentric conjunction by the application of an approximate correction taken from Mr. DOWNES's table, printed in the volumes of the American Ephemeris for 1882 to 1899. This correction must be reckoned in mean solar hours, and will be designated by the symbol  $t$ . It will have the same sign as  $h_0$ .

When DOWNES's table is not available, the correction may be computed from the formulæ,

$$\begin{aligned}\xi_0 &= \rho \cos \varphi' \sin h_0 \\ \xi' &= [9.4192] \rho \cos \varphi' \cos \frac{4}{3} h_0 \\ t &= \frac{\xi_0}{x' - \xi'}\end{aligned}$$

By applying  $t$  to the Washington mean time of geocentric conjunction, as given with the elements, we shall have the Washington mean time of local conjunction within a few minutes.

(2) Compute for the instant  $T + t$  the following quantities, in which  $t_0$  is the sidereal equivalent of the mean time interval  $t$ :

$$\begin{aligned}\xi &= \rho \cos \varphi' \sin (h_0 + t_0) \\ \eta &= \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (h_0 + t_0) = \eta_1 - \eta_2 \\ \xi' &= [9.4192] \rho \cos \varphi' \cos (h_0 + t_0) \\ \eta' &= [9.4192] \rho \cos \varphi' \sin \delta \sin (h_0 + t_0) = [9.4192] \xi \sin \delta \\ x &= x't \\ y &= Y + y't\end{aligned}$$

Compute also  $m$ ,  $M$ ,  $n$ ,  $N$ , and  $\psi$  from the equations

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta\end{aligned}$$

[Eph 10]

$$\begin{aligned}n \sin N &= x' - \xi' \\n \cos N &= y' - \eta' \\ \sin \psi &= [0.5646] m \sin (M - N)\end{aligned}$$

$\psi$  being taken between the limits  $\pm 90^\circ$ . Finally compute

$$\begin{aligned}\tau &= -\frac{[1.7782]m}{n} \cos (M - N) \mp \frac{[1.2135]}{n} \cos \psi \\ \delta\tau &= \frac{[6.7591]\tau^2}{n \cos \psi} [\eta_2 \cos (N \mp \psi) - \xi \sin (N \mp \psi)]\end{aligned}$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both  $\tau$  and  $\delta\tau$  thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated respectively  $\tau'$  and  $\delta\tau'$ , while those pertaining to emersion are designated  $\tau''$  and  $\delta\tau''$ . We then have for the Washington mean times of the phases

$$\begin{aligned}\text{Instant of immersion} &= T + t + \tau' + \delta\tau' \\ \text{Instant of emersion} &= T + t + \tau'' + \delta\tau''\end{aligned}$$

These expressions are practically exact, as the corrections  $\delta\tau$  seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results, it will be advisable to compute  $\xi$ ,  $\eta$ ,  $x$ , and  $y$  for the times of immersion and emersion finally obtained. If these times are correct the quantities in question will fulfill the condition,

$$\sqrt{(x - \xi)^2 + (y - \eta)^2} = 0.2725$$

If  $\log m \sin (M - N) > 9.4354$ ,  $\sin \psi$  will be numerically greater than unity, and no occultation is to be expected at the given place; but a very brief one may occur if the excess of the computed distance over the Moon's semidiameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol  $P$ . It is computed from the formula,

$$\begin{aligned}P &= N - \psi + \delta P && \text{for immersion,} \\ P &= N + \psi + \delta P \pm 180^\circ && \text{for emersion,}\end{aligned}$$

where the angles  $N - \psi$  and  $N + \psi$  are taken directly from the computation of  $\delta\tau$ , and  $\delta P$  is found in degrees of arc from the expression

$$\delta P = \mp \frac{[7.3038]\tau^2}{\cos \psi} [\eta_2 \sin N + \xi \cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex,  $V$ , is also reckoned in the direction from the north toward the east, and is found from the formula,

$$V = P - C$$

where  $C$  is computed from the expression

$$\tan C = \frac{\xi + [8.2218]\tau\xi' - [4.9810]\tau^2\xi}{\eta + [8.2218]\tau\eta' + [4.9810]\tau^2\eta}$$

$C$  being taken less or greater than  $180^\circ$ , according as the numerator is positive or negative.

The value of  $\tau$  employed in the latter formula must be so taken as to correspond with the phase for which  $C$  is required.

In the volumes of the American Ephemeris for the years 1882 to 1901 instructions are given for constructing three special tables which greatly diminish the labor of computing occultations, but as these tables should contain from 4 700 to 6 300 quantities, and as they would apply only to the place for which they were computed, it will rarely be worth while to undertake the labor of forming them. Those who desire further information on the subject may consult any one of the volumes in question.

As an example of an isolated occultation, we will compute that of  $\gamma$  Leonis on April 18, 1910, for Providence, whose position is—

$$\varphi = + 41^{\circ} 50' 21''$$

$$\lambda = - - 0^h 22^m 39^s.8$$

and whose geocentric co-ordinates are—

$$\rho \sin \varphi' = 9.8219$$

$$\rho \cos \varphi' = 9.8728$$

From the elements on page 454, we have

$$T = \begin{matrix} h & m \\ 6 & 43.6 \end{matrix}$$

$$H = - \begin{matrix} h & m \\ 1 & 34.0 \end{matrix}$$

and

$$h_0 = H - \lambda = - \begin{matrix} h & m \\ 1 & 11.3 \end{matrix}$$

From the formulæ on page 575, we find the correction,  $t$ , to the Washington mean time of geocentric conjunction,  $T$ , to be about  $-0^h 39^m.6$ ; therefore the Washington mean time of apparent conjunction is—

$$T + t = \text{April } 18^d 6^h 4^m.0.$$

$\gamma$ Leonis.	Apparent Declination.	W. T. of $\gamma$	Hour Angle.	$l'$	$x'$	$y'$
	$+ 17 \ 12.1$	April 18 $\begin{matrix} d & h & m \\ 6 & 43.6 \end{matrix}$	$\begin{matrix} h & m \\ - 1 & 34.0 \end{matrix}$	$+ 0.3997$	$0.5250$	$- 0.1929$
$T + t$	April 18 <sup>d</sup>	6 <sup>h</sup> 4 <sup>m</sup> .0				
$h_0$	$- 1 \ 11.3$				$x'$	$+ 0.5250$
$t_0$	$- 0 \ 39.7$				const. log	9.4192
$h_0 + t_0$	$- 1 \ 51.0$				$\xi \sin \delta$	9.0117 "
$\rho \cos \varphi'$	9.8728				log $\eta'$	8.4309 "
$\sin (h_0 + t_0)$	9.6680 "				$\eta'$	$- 0.0270$
log $\xi$	9.5408 "				$y'$	$- 0.1929$
$\xi$	$- 0.3473$				log $x'$	9.7202
$x$	$- 0.3465$				log $t$	9.8195 "
$\rho \sin \varphi'$	9.8219				log $x$	9.5397 "
$\cos \delta$	9.9801				$x$	$- 0.3465$
log $\eta_1$	9.8020				log $y'$	9.2853 "
$\eta_1$	$+ 0.6339$				log $y't$	9.1048
$\rho \cos \varphi'$	9.8728				$y't$	$+ 0.1273$
$\sin \delta$	9.4709				$Y$	$+ 0.3597$
$\cos (h_0 + t_0)$	9.9469				$y$	$+ 0.5270$
log $\eta_2$	9.2906				$x - \xi$	$+ 0.0008$
$\eta_2$	$+ 0.1953$				$y - \eta$	$+ 0.0884$
$\eta_1 - \eta_2 = \eta$	$+ 0.4386$				$x' - \xi'$	$+ 0.3516$
const. log	9.4192				$y' - \eta'$	$- 0.1659$
$\rho \cos \varphi' \cos (h_0 + t_0)$	9.8197				$m \sin M$	6.9031
log $\xi'$	9.2389				$m \cos M$	8.9465
$\xi'$	$+ 0.1734$				tan $M$	7.9566

$T + t$ April 18 <sup>d</sup> 6 <sup>h</sup> 4 <sup>m</sup> .0	const. log	1.7782 $n$
$M$ 0° 31'	$\log \frac{m}{n}$	9.3568
$\cos M$ 0.0000	$\cos (M - N)$	9.6219 $n$
$\log m$ 8.9465		0.7569
$n \sin N$ 9.5460	$- \frac{[1.7782]}{n} m \cos (M - N) +$	5.71
$n \cos N$ 9.2198 $n$	const. log	1.2135
$\tan N$ 0.3262 $n$	colog $n$	0.4103
$N$ 115° 16'	$\cos \psi$	9.9803
$\sin N$ 9.9563		1.6041
$\log n$ 9.5897	$\mp [1.2135] \cos \psi$	$\mp 40.19$
const. log 0.5646	$\tau$ for immersion $-$	$\frac{m}{n}$ 34.48
$\log m$ 8.9465	$\tau$ for emersion $+$	45.90
$\sin (M - N)$ 9.9582 $n$		
$\sin \psi$ 9.4693 $n$		
$\psi - 17^\circ 8'$		

The computation of  $\delta\tau$  for the two contacts is as follows:

	Immersion.	Emersion.
$N \mp \psi$	132° 24'	98° 8'
$\cos (N \mp \psi)$	9.8289 $n$	9.1507 $n$
$\log \tau_2$	9.2906	9.2906
$\log (1)$	9.1195 $n$	8.4413 $n$
(1)	$- 0.1317$	$- 0.0276$
$\sin (N \mp \psi)$	9.8683	9.9956
$\log \xi$	9.5408 $n$	9.5408 $n$
$\log (2)$	9.4091 $n$	9.5364 $n$
(2)	$- 0.2565$	$- 0.3439$
(1) - (2)	$+ 0.1248$	$+ 0.3163$
$\log [(1) - (2)]$	9.0962	9.5001
const. log	6.7591	6.7591
$\log \tau^2$	3.0752	3.3236
colog ( $n \cos \psi$ )	0.4300	0.4300
$\log \delta\tau$	9.3605	0.0128
$\delta\tau$	$+ 0.23$	$+ 1.03$
$\tau + \delta\tau$	$- 34.25$	$+ 46.93$
$T + t$	d h m	h m
Washington Mean Time of Phase,	April 18 6 4.0	6 4.0
$\lambda$	" 18 5 29.8	6 50.9
	$- 0 22.7$	$- 0 22.7$
Providence Mean Time,	" 18 5 52.5	7 13.6
To find $\delta P$ and $P$ :		
$\log \tau_2$ 9.2906	$\log \xi$ 9.5408 $n$	(3) $+ 0.1766$
$\sin N$ 9.9563	$\cos N$ 9.6301 $n$	(4) $+ 0.1482$
$\log (3)$ 9.2469	$\log (4)$ 9.1709	(3) + (4) $+ 0.3248$
$\log [(3) + (4)]$	Immersion.	Emersion.
const. log	9.5116	9.5116
$\log \tau^2$	7.3038 $n$	7.3038
colog $\cos \psi$	3.0752	3.3236
$\log \delta P$	0.0197	0.0197
	9.9103 $n$	0.1587

$\delta P$	— 0.81	+ 1.44
$N \mp \psi$	132.4	98.1
const.	0.0	180.0
	<hr/>	<hr/>
	131.6	279.5

Angle of position:

$P$

from the north point of the Moon's limb toward the east, for direct image.

*Occultations Visible at Washington*, pages 478-479.—Here are given in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

*Phenomena of Planets and Satellites*, pages 480-514.—These are, for the most part, sufficiently explained in the body of the work, but the following additional explanations may be of service in some cases:—

*Disks of Mercury, Venus, and Mars*, pages 480-482.—The angle  $\theta$ , needed in reducing meridian observations, is the angle which the arc of the great circle from the planet to the Sun makes with the arc from the planet toward the west, reckoned in the direction west, north, east, south. This position-angle is reckoned from  $0^\circ$  to  $360^\circ$ , as in the measurement of double stars, the planet taking the place of the central star, but its measure is  $90^\circ$  greater than in the case of a double star.

We may also regard  $\theta$  as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

*Satellites of Jupiter*, pages 483-507.—The abbreviations designating the phenomena are explained at the foot of each page.

*Satellites of Saturn*, pages 508-512.—The explanations are given on pages 508 and 509, the Washington mean times of greatest elongations on pages 509 to 511, and the apparent elements of the rings on page 511. The differences in right ascension and declination between Phœbe and Saturn for 1906 and 1909 are given on page 512.

*Satellites of Uranus*, page 513.—This page gives the diagram and ephemerides of the satellites, together with their position-angles and distances from the center of the planet.

*Satellite of Neptune*, page 514.—This page gives the diagram and ephemeris of the satellite, together with the position-angles and distances from the center of the planet.

*Phenomena*, pages 515-516.—The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are respectively the instants when the longitude of each planet differs from that of the Sun by  $0^\circ$ ,  $\pm 90^\circ$ , or  $180^\circ$ .

For the conjunction of the planets with the Moon, and with each other, the predicted times are the instants when the two bodies have the same right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

*Positions of Observatories*, pages 517-521.—The latest available data have been used in compiling these positions, and many of them have been furnished through the courtesy of the directors of the several observatories in response to a circular issued by this office. The values given for the *Reduction to Geocentric Latitude* and *Log  $\rho$*  are based upon Col. A. R. CLARKE'S elements of the terrestrial spheroid, published in 1866, from which we have—

$$\log e = 8.915\ 2515$$

$$\varphi' - \varphi = -11' \ 40'' .44 \sin 2\varphi + 1'' .19 \sin 4\varphi$$

$$\log \rho = 9.999\ 2645 + 0.000\ 7374 \cos 2\varphi - 0.000\ 0019 \cos 4\varphi$$

[Eph 10]

*PART IV*—STAR NUMBERS, APPARENT PLACES OF STARS, AND OTHER DATA, BASED ON THE CONSTANTS OF THE PARIS CONFERENCE OF MAY, 1896.

Page 524 contains the formulæ for reducing the positions of the fixed stars and for computing the star-numbers, the whole expressed in terms of the notation of BESSEL and the constants of the PARIS CONFERENCE of May, 1896.

Page 525 contains the usual data for precession, nutation, obliquity of the ecliptic, and the Sun's aberration, all of which will be rendered sufficiently clear by the explanations given on pages 563–564 respecting the similar data on pages 285–286.

Pages 526–529 contain the logarithms of the *Besselian Star-Numbers* *A*, *B*, *C*, *D*, for each Washington mean midnight, and pages 530–537 contain the *Independent Star-Numbers* for the same dates; to all of which the explanations given on pages 564–565 apply, except that the formulæ on page 524 must be employed instead of those on page 290.

Pages 538–549 contain the apparent positions of the five circumpolar stars,  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ , and  $\lambda$  Ursæ Minoris and  $\gamma$  Cephei, for their upper transit at Washington. The arrangement of the data is the same as on pages 312–323, and consequently the explanations given on page 565 apply here also.

Pages 550–554 contain, for every tenth upper transit at Washington, the apparent places of 25 stars, being all those embraced in the list on pages 304–311 whose declination exceeds  $\pm 78^\circ 30'$ , except the five circumpolar stars. For stars of less declination than  $\pm 78^\circ 30'$  the apparent places derived by using the constants of the PARIS CONFERENCE differ from those derived by using the constants of STRUVE and PETERS by quantities which never exceed  $0.015$  in right ascension or  $0''.05$  in declination, and consequently, throughout that range, the places given on pages 324–399 may be regarded as correct for either set of constants; or, in other words, when using the constants of the PARIS CONFERENCE the positions of all stars not contained in pages 550–554 may be taken with sufficient accuracy from pages 324–399. The explanation on page 565, respecting the data on pages 324–399, applies also to pages 550–554.

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*Latitude by Observed Altitude of Polaris*, page 593.—Table IV, page 593, replaces the Tables A, B, C, D, given as a *Supplement* to the volumes of the EPHEMERIS for 1874 to 1881, and is intended for use at sea and reconnaissance on land. It is constructed upon the assumption that Polaris has a declination of  $+88^\circ 49'.6$ , and an observed altitude of  $45^\circ$ , and will furnish an approximate value of the latitude, the probable error of which, in so far as the table is concerned, will be a few tenths of a minute of arc.

The directions for using the table are adapted to an assumed right ascension of  $1^h 26^m.8$  for Polaris, but somewhat greater accuracy may be insured by substituting the right ascension for the date of observation, from pages 312–323 of this volume.

# APPENDIX.

## ON THE CONSTRUCTION OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR 1910.

Among American astronomers there are wide differences of opinion respecting the decisions of the PARIS CONFERENCE of May, 1896, and for that reason it has been thought best to give, in the American Ephemeris for 1910, two wholly distinct sets of constants for precession, nutation, aberration, and mean obliquity of the ecliptic, namely: first, those of STRUVE and PETERS, and second, those adopted by the PARIS CONFERENCE of 1896. Their values for 1910.0 are as follows:

	Struve and Peters.	Paris Conference.
Precession . . . .	50.2661	50.2586
Nutation . . . .	9.2241	9.21
Aberration . . . .	20.4451	20.47
Mean Obliquity . .	23° 27' 3".11	23° 27' 3".58

The constants of STRUVE and PETERS are employed in the quantities on pages 286 to 399, and those of the PARIS CONFERENCE in the quantities on pages 524 to 554, and thus everyone is left free to choose between them. For stars distant more than 11° 30' from either pole, the apparent places derived by using the constants of the PARIS CONFERENCE differ from those derived by using the constants of STRUVE and PETERS by quantities which never exceed 0".015 in right ascension, and 0".05 in declination, and consequently throughout that region the star ephemerides given on pages 324 to 399 may be regarded as correct for either set of constants. For the five circumpolar stars, and twenty-five other stars whose declinations exceed  $\pm 78^\circ 30'$  two sets of ephemerides are given; one depending upon the constants of STRUVE and PETERS, and the other depending upon the constants of the PARIS CONFERENCE.

The formulæ for the reduction of stars from mean to apparent place, using the constants of STRUVE and PETERS, are given on page 290.

The nutation given on page 286, and used in the Besselian and independent star-numbers, page 303; in  $f'$ , pages 295 to 302, and in the ephemerides of the apparent places of the fixed stars for every tenth transit, pages 324 to 399, is computed with the values of  $A'$  and  $B'$  given on page 290, while the nutation used in the Besselian and independent star-numbers (except  $f'$ ) given on pages 291 to 302 is computed with the values of  $A$  and  $B$  given on page 290.

In the daily ephemeris of the five circumpolar stars given on pages 312 to 323 the nutation is computed with—

$$\begin{aligned}
 A = & \tau - 0.34255 \sin \Omega \\
 & + 0.00410 \sin 2\Omega \\
 & - 0.02519 \sin 2\odot \\
 & + 0.00293 \sin (\odot + 81^\circ 50') \\
 & + 0.00025 \sin (2\odot - \Omega) \\
 & - 0.00011 \sin (3\odot - I') \\
 & - 0.00005 \sin 2(\odot - \Omega) \\
 & + 0.00010 \sin 2(\odot - I'') \\
 & + 0.00009 \sin (2I'' - \Omega) \\
 & + 0.00005 \cos I' \\
 & + 0.00004 \sin 2I'' \\
 & - 0.00405 \sin 2\zeta \\
 & + 0.00135 \sin (\zeta - I'')
 \end{aligned}$$

$$\begin{aligned}
 B = & - 9.2241 \cos \Omega \\
 & + 0.0895 \cos 2\Omega \\
 & - 0.5506 \cos 2\odot \\
 & - 0.0092 \cos (\odot + 281^\circ 24') \\
 & - 0.0027 \cos (3\odot - I') \\
 & + 0.0067 \cos (2\odot - \Omega) \\
 & + 0.0024 \cos (2I'' - \Omega) \\
 & - 0.0023 \sin I'' \\
 & + 0.0008 \cos 2I'' \\
 & - 0.0885 \cos 2\zeta
 \end{aligned}$$

and the result in right ascension is diminished by the quantity  $f - f' = -0''.1866 \sin 2\zeta + 0''.0622 \sin (\zeta - I'')$ , which is the same for all stars.

The formulæ for the reduction of stars from mean to apparent place, using the constants of the PARIS CONFERENCE, are given on page 524.

The nutation on page 525 includes only the terms in  $\Omega$ ,  $2\Omega$ ,  $L$ ,  $2L$ , and  $3L$ . This value of the nutation has been used in all the ephemerides of the Sun, Moon, and planets, in the apparent places of the stars for every tenth transit given on pages 550 to 554, and in  $f'$  on pages 530 to 537. The nutation used in the daily ephemerides of the circumpolar stars, pages 538 to 549, is computed with—

$$\begin{aligned}
 A = & \tau - 0.34218 \sin \Omega \\
 & + 0.00415 \sin 2\Omega \\
 & - 0.02495 \sin 2L \\
 & + 0.00218 \sin (L + 75.^\circ 3) \\
 & - 0.00097 \sin (3L + 78.^\circ 7) \\
 & + 0.00025 \sin (2L - \Omega) \\
 & - 0.00005 \sin 2(L - \Omega) \\
 & + 0.00010 \sin 2(L - I'') \\
 & + 0.00009 \sin (2I'' - \Omega) \\
 & + 0.00005 \cos I'' \\
 & + 0.00004 \sin 2I'' \\
 & - 0.00405 \sin 2\zeta \\
 & + 0.00135 \sin (\zeta - I'') \\
 B = & - 9.2100 \cos \Omega \\
 & + 0.0900 \cos 2\Omega \\
 & - 0.5460 \cos 2L \\
 & - 0.0210 \cos (3L + 78.^\circ 7) \\
 & + 0.0090 \cos (L - 78.^\circ 7) \\
 & + 0.0067 \cos (2L - \Omega) \\
 & + 0.0024 \cos (2I'' - \Omega) \\
 & - 0.0023 \sin I'' \\
 & + 0.0008 \cos 2I'' \\
 & - 0.0885 \cos 2\zeta
 \end{aligned}$$

and the result in right ascension is diminished by the quantity  $f - f' = -0''.1866 \sin 2\zeta + 0''.0622 \sin (\zeta - I'')$ , which is the same for all stars.

The terms of short period in the nutation given on pages 287 and 288 are included in the values of the star-numbers on pages 526 to 537. They are derived in accordance with the formulæ—

$$\begin{aligned}
 \delta''\psi &= \text{Nutation in longitude} = A''\psi \\
 \delta''\omega &= \text{Nutation in obliquity} = -B''
 \end{aligned}$$

where  $\psi$  = the luni-solar precession =  $50''.3713$ , and  $A''$  and  $B''$  are respectively the short period terms in the expressions for  $A$  and  $B$  on page 524. By short period terms are meant all terms involving the Moon's mean longitude.

According to the formulæ on pages 290 and 524, the star constants  $a, b, c, d, a', b', c', d''$ , are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

$$\begin{array}{ll}
 \text{To } a - a_0 & \text{To } \delta - \delta_0 \\
 \left. \begin{aligned} & + 0.000003 \tau^2 \sin a \\ & - 0.000149 \tau^2 \cos a \end{aligned} \right\} \tan \delta & \left. \begin{aligned} & + 0.000975 \tau^2 \sin^2 a \\ & - 0.000023 \cos 2\Omega \end{aligned} \right\} \\
 \left. \begin{aligned} & - 0.0000650 \tau^2 \sin 2a \\ & + 0.0000103 \sin 2\Omega \cos 2a \end{aligned} \right\} \tan^2 \delta & \left. \begin{aligned} & - 0.000080 \cos 2\Omega \cos 2a \\ & - 0.000077 \sin 2\Omega \sin 2a \end{aligned} \right\} \tan \delta \\
 \left. \begin{aligned} & - 0.0000107 \cos 2\Omega \sin 2a \\ & + 0.0000620 \sin 2\odot \cos 2a \end{aligned} \right\} \sec^2 \delta & \left. \begin{aligned} & + 0.000040 \cos 2\odot \\ & - 0.000467 \cos 2\odot \cos 2a \end{aligned} \right\} \\
 - 0.0000622 \cos 2\odot \sin 2a & - 0.000465 \sin 2\odot \sin 2a
 \end{array}$$



To $\alpha - \alpha_0$		To $\delta - \delta_0$
$\left. \begin{aligned} &+ 0.000\ 0513 \sin (\odot + \Omega) \cos 2\alpha \\ &- 0.000\ 0507 \cos (\odot + \Omega) \sin 2\alpha \\ &+ 0.000\ 0097 \sin (\odot - \Omega) \cos 2\alpha \\ &- 0.000\ 0053 \cos (\odot - \Omega) \sin 2\alpha \end{aligned} \right\} \tan \delta \sec \delta$	}	$\left. \begin{aligned} &- 0.000\ 039 \cos (\odot + \Omega) \\ &- 0.000\ 380 \cos (\odot + \Omega) \cos 2\alpha \\ &- 0.000\ 385 \sin (\odot + \Omega) \sin 2\alpha \\ &- 0.000\ 380 \cos (\odot - \Omega) \\ &- 0.000\ 040 \cos (\odot - \Omega) \cos 2\alpha \\ &- 0.000\ 072 \sin (\odot - \Omega) \sin 2\alpha \end{aligned} \right\} \sin \delta \tan \delta$

These terms are negligible for stars whose declination is numerically less than  $80^\circ$ , but in computing the apparent places given in the *American Ephemeris* they have been applied whenever sensible.

The mean places of 383 stars, pages 304 to 311, are from the new *Catalogue of Fundamental Stars, for the epochs 1875 and 1900, Astronomical Papers of the American Ephemeris*, vol. VIII, part 2, prepared in this office, principally under the direction of Professor NEWCOMB.

The apparent places of Sirius and Procyon have been corrected for the effect of orbital motion, as determined from AUWERS' investigations, and tabulated in *Astronomical Papers of the American Ephemeris*, vol. I, pages 297-298. The values of these corrections are—

Year.	$\Delta \alpha =$	$\Delta \delta =$	Sirius.	"	$\Delta \alpha =$	$\Delta \delta =$	Procyon.	"
1910.0	$\Delta \alpha = -0.127$	$\Delta \delta = +0.26$			$\Delta \alpha = -0.046$	$\Delta \delta = -0.80$		
1911.0	$\Delta \alpha = -0.133$	$\Delta \delta = +0.14$			$\Delta \alpha = -0.053$	$\Delta \delta = -0.69$		

The ephemeris of the Sun is constructed from Professor NEWCOMB'S *Tables of the Sun, Astronomical Papers of the American Ephemeris*, vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is  $8''.80$ , *Paris Conference, May, 1896*.

The adopted apparent semidiameter of the Sun at the Earth's mean distance is that found by Prof. WM. HARKNESS, from 35 842 meridian observations made at Greenwich, Paris, Washington, Königsberg, Milan, Madras, Dorpat, Modena, and Seeberg, viz.,  $16' 1''.50$ ; while in the computation of eclipses, the value given by AUWERS in the *Astronomische Nachrichten*, 1891, Bd. 128, S. 367, is employed, viz.,  $15' 59''.63$ .

The Sun's rectangular equatorial co-ordinates are computed from the longitudes and latitudes by the following formulæ:—

$$\begin{aligned} X &= R \cos \lambda \\ Y &= R \sin \lambda \cos \omega - 19.3 R \beta \\ Z &= R \sin \lambda \sin \omega + 44.5 R \beta \end{aligned}$$

The reductions to mean equinox, 1910.0, are computed by the formulæ:—

$$\begin{aligned} \Delta X &= + Y \sec \omega \Delta \lambda \sin 1'' \\ \Delta Y &= - X \cos \omega \Delta \lambda \sin 1'' + Z \Delta \omega \sin 1'' + 9.1 \tau R \sin (\lambda + 6^\circ) \\ \Delta Z &= - X \sin \omega \Delta \lambda \sin 1'' - Y \Delta \omega \sin 1'' - 21.0 \tau R \sin (\lambda + 6^\circ) \end{aligned}$$

where the numerical coefficients are in units of the seventh place of decimals and

- $R$  = the Sun's radius vector;
- $\lambda$  = the Sun's true longitude;
- $\beta$  = the Sun's true latitude, expressed in seconds of arc;
- $\omega$  = the obliquity of the ecliptic;
- $\Delta \lambda$  = the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year;
- $\Delta \omega$  = the reduction of the mean to the apparent obliquity;
- $\tau$  = the fraction of the year since the beginning of the Besselian fictitious year.

The longitude, latitude, and parallax of the Moon are derived from HANSEN'S *Tables de la Lune*, London, 1857, the mean longitude being corrected in accordance with Professor NEWCOMB'S *Researches on the Motion of the Moon*, Part I, page 268,\* and Table XXXIV being replaced by a corrected one.

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax,  $\pi$ , by the formula,

$$S = 0.272\ 506\ \pi + 1''.50$$

where the constant 0.272 506 is based on data from occultations given by Mr. J. PETERS in the *Astronomische Nachrichten*, 1895, Bd. 138, S. 147; and the constant 1''.50 is added to cover the average effect of irradiation. The value of the Moon's semidiameter employed in the computation of eclipses for 1910 was computed from the formula,

$$S = 0.272\ 274\ \pi$$

the constant being the one used in this Ephemeris prior to 1902.

The ephemerides of Mercury, Venus, and Mars are derived from Professor NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, vol. VI, parts 2, 3, and 4.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by Dr. GEORGE W. HILL, *Astronomical Papers of the American Ephemeris*, vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from Professor NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, vol. VII, parts 3 and 4.

The semidiameters of the planets are computed from the following values:—

	Semidiameter.	Log Dist.	Authority.
Mercury	3.34	0.00	LE VERRIER, <i>Theory of Mercury</i> .
Venus	8.546 $\pm$ 0.086	0.00	
Mars	2.842 $\pm$ 0.057	0.25	PEIRCE, from the Washington Observations of 1845 and 1846, made with the Mural Circle.
Jupiter (polar)	18.78 $\pm$ 0.067	0.70	
Saturn (polar)	8.77 $\pm$ 0.039	0.95	
Uranus	1.68 $\pm$ 0.3	1.30	
Neptune	1.28	1.48	
Jupiter (equatorial)	20.00	0.70	
Saturn (equatorial)	9.38	0.95	

The elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with BESSEL'S method, the special forms employed being a modification of those developed in CHAUVENET'S *Spherical and Practical Astronomy*.

The satellites of Mars are computed from manuscript tables based upon elements deduced by Prof. WALTER S. HARSHMAN. His elements of Deimos are published in the *Astronomical Journal*, 1894, vol. XIV, p. 147; but those of Phobos are yet in manuscript.

The eclipses of Jupiter's satellites are computed from a *Continuation of DAMOISEAU'S Tables*. The occultations, transits, etc., are computed from WOOLHOUSE'S tables, published in the *British Nautical Almanac* for 1835; Table II of each satellite having been adapted to DAMOISEAU'S tables.

The fifth satellite of Jupiter is computed from manuscript tables based upon unpublished elements deduced by Mr. J. ROBERTSON.

The elongations and conjunctions of the satellites and the position of the rings of Saturn are computed from manuscript tables based on Prof. H. STRUVE'S elements as published in *Beobachtungen der Saturnstrabanten*, St. Petersburg, 1898. The differential coordinates of Phœbe have been computed from the elements and tables of Dr. F. E. ROSS, printed in the *Annals of Harvard College*, vol. LIII, No. VI.

\* *Astronomical Observations made at the U. S. Naval Observatory, Washington, 1875, Appendix II.*

The apparent dimensions of the rings of Saturn are computed from BESSEL's data, except those for the dusky ring, which are based on the observations of Messrs. O. STRUVE, A. HALL, E. E. BARNARD, and T. LEWIS, at Pulkowa, Washington, Mount Hamilton, and Greenwich.

The elongations of the satellites of Uranus are computed from the data of Professor NEWCOMB'S *Uranian and Neptunian Systems, Washington Observations*, 1873, Appendix I.

The elongations of the satellite of Neptune are computed from manuscript tables based upon Prof. A. HALL's elements published in the *Astronomical Journal*, 1898, vol. XIX, p. 65.

The following-named persons were engaged in the preparation of the American Ephemeris and Nautical Almanac for the year 1910:

*Assistants and Employees.*—H. B. HEDRICK, W. AUHAGEN, J. ROBERTSON, H. G. HODGKINS, W. T. CARRIGAN, E. D. TILLYER, ARTHUR SNOW, ARTHUR NEWTON, E. C. HOWELL, W. M. HAMILTON, REUEL KEITH, ROBERDEAU BUCHANAN, E. B. DAVIS, A. DOOLITTLE, J. MCWILLIAM, H. F. M. HEDRICK, H. B. EVANS, THEO I. KING, and GEO. B. MERRIMAN.

[Eph 10]

TABLE I.

CORRECTION REQUIRED, ON ACCOUNT OF SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING THE GREENWICH TIME CORRESPONDING TO A CORRECTED LUNAR DISTANCE.

		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																											
Approximate Interval.		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52		
h	m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0	10	0	0	0	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3		
0	20	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6		
0	30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	8	8	8	9	9		
0	40	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11		
0	50	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	9	10	10	11	12	12	13	13		
1	0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	14	14		
1	10	1	1	2	2	3	4	4	5	6	6	7	7	8	8	9	9	10	11	11	12	12	13	13	14	15	15		
1	20	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	16	16		
1	30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16		

		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																											
		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100				
h	m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s			
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
0	10	4	4	4	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	7			
0	20	7	7	7	7	8	8	8	8	9	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12			
0	30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17	17			
0	40	12	12	13	13	13	14	14	15	15	16	16	16	17	17	18	18	19	19	19	20	20	21	21	21	22			
0	50	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	22	23	23	24	24	25	25			
1	0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28	28			
1	10	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30	30			
1	20	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31	31			
1	30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31	31			

		DIFFERENCE OF THE PROPORTIONAL LOGARITHMS IN THE EPHEMERIS.																		
		102	104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138
h	m	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	10	7	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9
0	20	13	13	13	13	14	14	14	14	15	15	15	15	15	15	16	16	16	17	17
0	30	18	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24
0	40	22	22	23	23	24	24	25	25	25	26	26	27	27	28	28	29	29	30	30
0	50	26	26	26	27	27	28	29	29	29	30	30	31	31	32	32	33	33	34	34
1	0	28	29	29	30	30	31	31	32	33	33	34	34	35	35	36	37	37	38	38
1	10	30	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41
1	20	31	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42
1	30	32	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43

The correction is to be added to the approximate Greenwich time when the proportional logarithms in the Ephemeris are decreasing, and subtracted when they are increasing.

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.										
Side- real.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19 659	0 29.489	0 39 318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.785	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161
Side- real.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.										
Side- real.	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	12 <sup>h</sup>	13 <sup>h</sup>	14 <sup>h</sup>	15 <sup>h</sup>	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	I 18.636	I 28.466	I 38.296	I 48.125	I 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	I 18.800	I 28.630	I 38.459	I 48.289	I 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	I 18.964	I 28.794	I 38.623	I 48.453	I 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	I 19.128	I 28.958	I 38.787	I 48.617	I 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	I 19.292	I 29.121	I 38.951	I 48.780	I 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	I 19.456	I 29.285	I 39.115	I 48.944	I 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	I 19.619	I 29.449	I 39.279	I 49.108	I 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	I 19.783	I 29.613	I 39.442	I 49.272	I 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	I 19.947	I 29.777	I 39.606	I 49.436	I 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	I 20.111	I 29.940	I 39.770	I 49.600	I 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	I 20.275	I 30.104	I 39.934	I 49.763	I 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	I 20.439	I 30.268	I 40.098	I 49.927	I 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	I 20.602	I 30.432	I 40.261	I 50.091	I 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	I 20.766	I 30.596	I 40.425	I 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	I 20.930	I 30.760	I 40.589	I 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	I 21.094	I 30.923	I 40.753	I 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	I 21.258	I 31.087	I 40.917	I 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	I 21.422	I 31.251	I 41.081	I 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	I 21.585	I 31.415	I 41.244	I 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	I 21.749	I 31.579	I 41.408	I 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	I 21.913	I 31.743	I 41.572	I 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	I 22.077	I 31.906	I 41.736	I 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	I 22.241	I 32.070	I 41.900	I 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	I 22.404	I 32.234	I 42.064	I 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	I 22.568	I 32.398	I 42.227	I 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	I 22.732	I 32.562	I 42.391	I 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	I 22.896	I 32.726	I 42.555	I 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	I 23.060	I 32.889	I 42.719	I 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	I 23.224	I 33.053	I 42.883	I 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	I 23.387	I 33.217	I 43.047	I 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	I 23.551	I 33.381	I 43.210	I 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	I 23.715	I 33.545	I 43.374	I 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	I 23.879	I 33.708	I 43.538	I 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	I 24.043	I 33.872	I 43.702	I 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	I 24.207	I 34.036	I 43.866	I 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	I 24.370	I 34.200	I 44.029	I 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	I 24.534	I 34.364	I 44.193	I 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	I 24.698	I 34.528	I 44.357	I 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	I 24.862	I 34.691	I 44.521	I 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	I 25.026	I 34.855	I 44.685	I 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	I 25.190	I 35.019	I 44.849	I 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	I 25.353	I 35.183	I 45.012	I 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	I 25.517	I 35.347	I 45.176	I 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	I 25.681	I 35.511	I 45.340	I 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	I 25.845	I 35.674	I 45.504	I 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	I 26.009	I 35.838	I 45.668	I 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	I 26.172	I 36.002	I 45.832	I 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	I 26.336	I 36.166	I 45.995	I 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	I 26.500	I 36.330	I 46.159	I 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	I 26.664	I 36.493	I 46.323	I 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	I 26.828	I 36.657	I 46.487	I 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	I 26.992	I 36.821	I 46.651	I 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	I 27.155	I 36.985	I 46.815	I 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	I 27.319	I 37.149	I 46.978	I 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	I 27.483	I 37.313	I 47.142	I 56.972	2 6.801	2 16.531	2 26.460	2 36.290	54	0.147
55	I 27.647	I 37.476	I 47.306	I 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	I 27.811	I 37.640	I 47.470	I 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	I 27.975	I 37.804	I 47.634	I 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	I 28.138	I 37.968	I 47.797	I 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	I 28.302	I 38.132	I 47.961	I 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161
Side- real.	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	12 <sup>h</sup>	13 <sup>h</sup>	14 <sup>h</sup>	15 <sup>h</sup>	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

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TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.										
Side- real.	16 <sup>h</sup>	17 <sup>h</sup>	18 <sup>h</sup>	19 <sup>h</sup>	20 <sup>h</sup>	21 <sup>h</sup>	22 <sup>h</sup>	23 <sup>h</sup>	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161
Side- real.	16 <sup>h</sup>	17 <sup>h</sup>	18 <sup>h</sup>	19 <sup>h</sup>	20 <sup>h</sup>	21 <sup>h</sup>	22 <sup>h</sup>	23 <sup>h</sup>	For Seconds.	

TO BE ADDED TO A MEAN TIME INTERVAL.									
Mean Solar.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0 0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1 0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2 0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3 0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4 0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5 0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6 0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7 0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8 0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9 0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10 0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11 0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12 0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13 0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14 0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15 0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0 51.911	1 1.767	1 11.624	16 0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17 0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18 0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19 0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20 0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21 0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22 0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23 0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24 0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25 0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26 0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27 0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28 0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29 0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30 0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31 0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32 0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33 0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34 0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35 0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36 0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37 0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38 0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39 0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40 0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41 0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42 0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43 0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44 0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45 0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46 0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47 0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48 0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49 0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50 0.137
51	0 8.378	0 18.234	0 28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51 0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52 0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53 0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54 0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55 0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56 0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57 0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58 0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59 0.162
Mean Solar.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>	6 <sup>h</sup>	7 <sup>h</sup>	For Seconds.



TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.									
Mean Solar.	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	12 <sup>h</sup>	13 <sup>h</sup>	14 <sup>h</sup>	15 <sup>h</sup>	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	18.852	18.708	18.565	18.421	18.278	2 8.134	2 17.991	2 27.847	0 0.000
1	19.016	18.873	18.729	18.585	18.442	2 8.298	2 18.155	2 28.011	1 0.003
2	19.180	19.037	18.893	18.750	18.606	2 8.463	2 18.319	2 28.176	2 0.005
3	19.345	19.201	19.058	18.914	18.771	2 8.627	2 18.483	2 28.340	3 0.008
4	19.509	19.365	19.222	19.078	18.935	2 8.791	2 18.648	2 28.504	4 0.011
5	19.673	19.530	19.386	19.243	19.099	2 8.956	2 18.812	2 28.668	5 0.014
6	19.837	19.694	19.550	19.407	19.263	2 9.120	2 18.976	2 28.833	6 0.016
7	20.002	19.858	19.715	19.571	19.428	2 9.284	2 19.141	2 28.997	7 0.019
8	20.166	19.022	19.879	19.735	19.592	2 9.448	2 19.305	2 29.161	8 0.022
9	20.330	19.187	19.043	18.900	18.756	2 9.613	2 19.469	2 29.326	9 0.025
10	20.495	19.351	19.207	19.064	18.920	2 9.777	2 19.633	2 29.490	10 0.027
11	20.659	19.515	19.372	19.228	19.085	2 9.941	2 19.798	2 29.654	11 0.030
12	20.823	19.680	19.536	19.393	19.249	2 10.105	2 19.962	2 29.818	12 0.033
13	20.987	19.844	19.700	19.557	19.413	2 10.270	2 20.126	2 29.983	13 0.036
14	21.152	19.008	19.865	19.721	19.578	2 10.434	2 20.290	2 30.147	14 0.038
15	21.316	19.172	19.029	18.885	18.742	2 10.598	2 20.455	2 30.311	15 0.041
16	21.480	19.337	19.193	19.050	18.906	2 10.763	2 20.619	2 30.476	16 0.044
17	21.644	19.501	19.357	19.214	19.070	2 10.927	2 20.783	2 30.640	17 0.047
18	21.809	19.665	19.522	19.378	19.235	2 11.091	2 20.948	2 30.804	18 0.049
19	21.973	19.829	19.686	19.542	19.399	2 11.255	2 21.112	2 30.968	19 0.052
20	22.137	19.994	19.850	19.707	19.563	2 11.420	2 21.276	2 31.133	20 0.055
21	22.302	20.158	19.015	18.871	18.727	2 11.584	2 21.440	2 31.297	21 0.057
22	22.466	20.322	19.179	19.035	18.892	2 11.748	2 21.605	2 31.461	22 0.060
23	22.630	20.487	19.343	19.200	19.056	2 11.912	2 21.769	2 31.625	23 0.063
24	22.794	20.651	19.507	19.364	19.220	2 12.077	2 21.933	2 31.790	24 0.066
25	22.959	20.815	19.672	19.528	19.385	2 12.241	2 22.098	2 31.954	25 0.068
26	23.123	20.979	19.836	19.692	19.549	2 12.405	2 22.262	2 32.118	26 0.071
27	23.287	21.144	19.000	19.857	19.713	2 12.570	2 22.426	2 32.283	27 0.074
28	23.451	21.308	19.164	19.021	19.877	2 12.734	2 22.590	2 32.447	28 0.077
29	23.616	21.472	19.329	19.185	19.042	2 12.898	2 22.755	2 32.611	29 0.079
30	23.780	21.637	19.493	19.349	19.206	2 13.062	2 22.919	2 32.775	30 0.082
31	23.944	21.801	19.657	19.514	19.370	2 13.227	2 23.083	2 32.940	31 0.085
32	24.109	21.965	19.822	19.678	19.534	2 13.391	2 23.247	2 33.104	32 0.088
33	24.273	22.129	19.986	19.842	19.699	2 13.555	2 23.412	2 33.268	33 0.090
34	24.437	22.294	20.150	19.007	19.863	2 13.720	2 23.576	2 33.432	34 0.093
35	24.601	22.458	20.314	19.171	20.027	2 13.884	2 23.740	2 33.597	35 0.096
36	24.766	22.622	20.479	19.335	20.192	2 14.048	2 23.905	2 33.761	36 0.099
37	24.930	22.786	20.643	19.499	20.356	2 14.212	2 24.069	2 33.925	37 0.101
38	25.094	22.951	20.807	19.664	20.520	2 14.377	2 24.233	2 34.090	38 0.104
39	25.259	23.115	20.971	19.828	20.684	2 14.541	2 24.397	2 34.254	39 0.107
40	25.423	23.279	21.136	19.992	20.849	2 14.705	2 24.562	2 34.418	40 0.110
41	25.587	23.444	21.300	20.156	21.013	2 14.869	2 24.726	2 34.582	41 0.112
42	25.751	23.608	21.464	20.321	21.177	2 15.034	2 24.890	2 34.747	42 0.115
43	25.916	23.772	21.629	20.485	21.342	2 15.198	2 25.054	2 34.911	43 0.118
44	26.080	23.936	21.793	20.649	21.506	2 15.362	2 25.219	2 35.075	44 0.120
45	26.244	24.101	21.957	20.814	21.670	2 15.527	2 25.383	2 35.239	45 0.123
46	26.408	24.265	22.121	20.978	21.834	2 15.691	2 25.547	2 35.404	46 0.126
47	26.573	24.429	22.286	21.142	21.999	2 15.855	2 25.712	2 35.568	47 0.129
48	26.737	24.593	22.450	21.306	22.163	2 16.019	2 25.876	2 35.732	48 0.131
49	26.901	24.758	22.614	21.471	22.327	2 16.184	2 26.040	2 35.897	49 0.134
50	27.066	24.922	22.778	21.635	22.491	2 16.348	2 26.204	2 36.061	50 0.137
51	27.230	25.086	22.943	21.799	22.656	2 16.512	2 26.369	2 36.225	51 0.140
52	27.394	25.251	23.107	21.964	22.820	2 16.676	2 26.533	2 36.389	52 0.142
53	27.558	25.415	23.271	22.128	22.984	2 16.841	2 26.697	2 36.554	53 0.145
54	27.723	25.579	23.436	22.292	23.149	2 17.005	2 26.861	2 36.718	54 0.148
55	27.887	25.743	23.600	22.456	23.313	2 17.169	2 27.026	2 36.882	55 0.151
56	28.051	25.908	23.764	22.621	23.477	2 17.334	2 27.190	2 37.047	56 0.153
57	28.215	26.072	23.928	22.785	23.641	2 17.498	2 27.354	2 37.211	57 0.156
58	28.380	26.236	24.093	22.949	23.806	2 17.662	2 27.519	2 37.375	58 0.159
59	28.544	26.400	24.257	23.113	23.970	2 17.826	2 27.683	2 37.539	59 0.162
Mean Solar.	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>	12 <sup>h</sup>	13 <sup>h</sup>	14 <sup>h</sup>	15 <sup>h</sup>	For Seconds.

TO BE ADDED TO A MEAN TIME INTERVAL.									
Mean Solar.	16 <sup>h</sup>	17 <sup>h</sup>	18 <sup>h</sup>	19 <sup>h</sup>	20 <sup>h</sup>	21 <sup>h</sup>	22 <sup>h</sup>	23 <sup>h</sup>	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0 0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1 0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2 0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3 0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4 0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5 0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6 0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7 0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8 0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9 0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10 0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11 0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12 0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13 0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14 0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15 0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16 0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17 0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18 0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19 0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20 0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21 0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22 0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23 0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24 0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25 0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26 0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27 0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28 0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29 0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30 0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31 0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32 0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33 0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34 0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35 0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36 0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37 0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38 0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39 0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40 0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41 0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42 0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43 0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44 0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45 0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46 0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47 0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48 0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49 0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50 0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51 0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52 0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53 0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54 0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55 0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56 0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57 0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58 0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59 0.162
Mean Solar.	16 <sup>h</sup>	17 <sup>h</sup>	18 <sup>h</sup>	19 <sup>h</sup>	20 <sup>h</sup>	21 <sup>h</sup>	22 <sup>h</sup>	23 <sup>h</sup>	For Seconds.

TABLE FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

If the sidereal time is  $\begin{cases} \text{less than } 1^{\text{h}} 26^{\text{m}}.8, \text{ subtract it from } 1^{\text{h}} 26^{\text{m}}.8; \\ \text{between } 1^{\text{h}} 26^{\text{m}}.8 \text{ and } 13^{\text{h}} 26^{\text{m}}.8, \text{ subtract } 1^{\text{h}} 26^{\text{m}}.8 \text{ from it;} \\ \text{greater than } 13^{\text{h}} 26^{\text{m}}.8, \text{ subtract it from } 25^{\text{h}} 26^{\text{m}}.8; \end{cases}$

and the remainder is the hour-angle of Polaris.

With this hour-angle take out the correction from Table IV (below), and add it to or subtract it from the true altitude, according to its sign. The result is the approximate latitude of the place.

*Example.*—1910, October 27, at  $10^{\text{h}} 40^{\text{m}} 30^{\text{s}}$ , P. M., mean solar time, in longitude  $29^{\circ}$  east of Greenwich, suppose the true altitude of Polaris to be  $43^{\circ} 20'$ : required the latitude of the place.

Local astronomical mean time	h	m	s
Reduction from Table III, for $10^{\text{h}} 40^{\text{m}} 30^{\text{s}}$	10	40	30
Greenwich sidereal time of mean noon, October 27, page 165	+	1	45
Reduction from Table III, for longitude ( $= 1^{\text{h}} 56^{\text{m}}$ east, or minus)	14	19	52
Sum (having regard to signs) is equal to local sidereal time	—	0	19
	1	1	48
Subtract sidereal time	h	m	s
Remainder is equal to hour-angle of Polaris	1	26	48
	1	1	48
	0	25	0
True altitude	+	43	20
Correction from Table IV (below)	—	1	10
Approximate latitude	+	42	10

TABLE IV—1910.

Hour-angle.	0 <sup>h</sup>	1 <sup>h</sup>	2 <sup>h</sup>	3 <sup>h</sup>	4 <sup>h</sup>	5 <sup>h</sup>
m						
0	— 0 10.4	— 0 8.0	— 0 0.8	— 0 49.4	— 0 34.7	— 0 17.6
5	1 10.4 0.0	1 7.6 0.4	1 0.0 0.8	0 48.3 1.1	0 33.3 1.4	0 16.1 1.5
10	1 10.4 0.0	1 7.1 0.5	0 59.2 0.8	0 47.2 1.1	0 32.0 1.3	0 14.6 1.5
15	1 10.3 0.1	1 6.6 0.5	0 58.3 0.9	0 46.0 1.2	0 30.6 1.4	0 13.0 1.6
20	— 1 10.2	— 1 6.1	— 0 57.5	— 0 44.8	— 0 29.2	— 0 11.5
25	1 10.0 0.2	1 5.6 0.5	0 56.6 0.9	0 43.6 1.2	0 27.8 1.4	0 10.0 1.5
30	1 9.8 0.2	1 5.0 0.6	0 55.6 1.0	0 42.4 1.2	0 26.3 1.5	0 8.5 1.5
35	1 9.6 0.2	1 4.4 0.6	0 54.6 1.0	0 41.2 1.2	0 24.9 1.4	0 7.0 1.5
40	— 1 9.4	— 1 3.7	— 0 53.6	— 0 39.9	— 0 23.4	— 0 5.4
45	1 9.1 0.3	1 3.0 0.7	0 52.6 1.0	0 38.6 1.3	0 22.0 1.4	0 3.9 1.5
50	1 8.7 0.3	1 2.3 0.7	0 51.6 1.1	0 37.3 1.3	0 20.5 1.5	0 2.4 1.6
55	1 8.4 0.3	1 1.6 0.7	0 50.5 1.1	0 36.0 1.3	0 19.0 1.5	— 0 0.8 1.5
60	— 1 8.0	— 1 0.8	— 0 49.4	— 0 34.7	— 0 17.6	+ 0 0.7 1.5
Hour-angle.	6 <sup>h</sup>	7 <sup>h</sup>	8 <sup>h</sup>	9 <sup>h</sup>	10 <sup>h</sup>	11 <sup>h</sup>
m						
0	+ 0 0.7	+ 0 18.9	+ 0 35.8	+ 0 50.2	+ 1 1.2	+ 1 8.1
5	0 2.3 1.6	0 20.4 1.5	0 37.1 1.3	0 51.2 1.0	1 1.9 0.7	1 8.5 0.4
10	0 3.8 1.5	0 21.8 1.4	0 38.4 1.3	0 52.3 1.1	1 2.6 0.7	1 8.8 0.3
15	0 5.3 1.5	0 23.3 1.4	0 39.6 1.2	0 53.3 1.0	1 3.3 0.7	1 9.1 0.3
20	+ 0 6.8	+ 0 24.7	+ 0 40.9	+ 0 54.3	+ 1 4.0	+ 1 9.4
25	0 8.4 1.6	0 26.2 1.5	0 42.1 1.2	0 55.2 0.9	1 4.6 0.6	1 9.6 0.2
30	0 9.9 1.5	0 27.6 1.4	0 43.3 1.2	0 56.2 1.0	1 5.2 0.6	1 9.8 0.2
35	0 11.4 1.5	0 29.0 1.4	0 44.5 1.2	0 57.1 0.8	1 5.7 0.6	1 10.0 0.2
40	+ 0 12.9	+ 0 30.4	+ 0 45.7	+ 0 57.9	+ 1 6.3	+ 1 10.2
45	0 14.4 1.5	0 31.7 1.3	0 46.8 1.1	0 58.8 0.9	1 6.8 0.5	1 10.3 0.1
50	0 15.9 1.5	0 33.1 1.3	0 48.0 1.2	0 59.6 0.8	1 7.2 0.4	1 10.4 0.0
55	0 17.4 1.5	0 34.4 1.3	0 49.1 1.1	1 0.4 0.8	1 7.7 0.5	1 10.4 0.0
60	+ 0 18.9	+ 0 35.8	+ 0 50.2	+ 1 1.2	+ 1 8.1	+ 1 10.4



















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